THE

AMERICAN GAS-LIGHT JOURNAL.

THE OFFICIAL GAZETTE OF

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

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Herring's Champion Burglar-Proof Safes, with Herring & Floyd's New Patent Crystalized Iron, the only metal which cannot be drilled.

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Messrs. Herring & Co., New York:

Gentlemen,—At the great fire which occurred here on the 18th December last, my store, with a number of other buildings, was entirely destroyed; no less than seven places of business were burnt out and five of your safes severely tested, in every instance saving their entire contents, to the complete and perfect satisfaction of the owners. Two of your Herring's Patent Champion Safes which were in my building remained there through the entire conflagration, and were not opened until the day after the fire. No water was thrown on the building. Everything in my safe after the fire was nearly as good as new. C. L. Wilcox also preserved all his books, papers, and money in two of your safes, both being in same fire. Wm. Roberts was also the fortunate owner of another of your Patent Champion Safes, which was severely tested, and saved completely his books, papers, and money. The result has given great satisfaction, and we want no safe but Herring's Champion. Please send me one same size I last bought of you immediately. Send by N. Y. & Erie R.R. via Tioga depot. JOHN R. BOWEN.

I had two of Herring's Safes in above fire. They saved my books, papers, and $2,000 *in bank bills.* C. L. WILCOX.

HERRING'S PATENT CHAMPION saved my books, papers, and about $400 in *paper money.* I would use no other. WILLIAM ROBERTS.

GREAT FIRE IN PEARL AND FULTON STS.

NEW YORK, Jan. 27, 1862.

Messrs. HERRING & Co., No. 251 Broadway:

Gentlemen,—The large HERRING'S PATENT CHAMPION SAFE you made for me a few years ago has been put to a severe test in the great fire corner Fulton and Pearl sts., on the 26th inst., which entirely destroyed my building, together with many others.

The fire commenced about 6 o'clock on Sunday morning, and the safe was taken from the ruins after an exposure of more than thirty hours.

Your Safe contained all my books, insurance policies, and other valuable papers besides, gold and silver, bank bills, coupon bonds, &c., amounting to over Two Hundred Thousand Dollars. Everything in the Safe is in perfect order, except the binding of the books being steamed.

Your Patent Champion Safe gives us great satisfaction, and has guarded safely through the fire every dollar of its contents.

Truly yours, A. S. FOSTER.

GREAT FIRE IN NEW JERSEY.

NEW BRUNSWICK, N. J., January 18th, 1862.

Messrs. HERRING & Co.,

No. 251 Broadway, New York:

Gentlemen,—At the recent extensive fire in our city, on Wednesday morning last, 15th inst., I was the fortunate owner of one of your HERRING'S PATENT CHAMPION SAFES, which contained some books and a number of valuable papers.

The heat in my store was very great, and the safe subject to an intense heat. I felt great interest in the safety of my papers, as a number of castings in my store and within a few feet of the safe were melted. Nothing, indeed, was saved in my building, except the contents of your safe, which I am happy to inform you was completely preserved, after a thorough roasting for some seventeen hours. The result has exceeded my anticipations, and fully confirmed my confidence in the security of your Herring's Patent Safe. Please send me another of larger size, and refer all incredulous to my books and papers, which it gives me great pleasure to show.

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PROPOSALS.

NAVY DEPARTMENT, WASHINGTON, Feb. 20, 1862.

IRON-CLAD STEAMERS.—The Navy Department will, until the 24th of March next, receive propositions for the complete construction and equipment of IRON-CLAD VESSELS for river. harbor and coast defence.

These vessels, with the exception of those for the Mississippi River and its tributaries, will be propelled by screws; those for the Mississippi River and tributaries may be propelled by paddle-wheels The hulls will be either wholly of iron (which would be preferred) or of iron and wood combined, as the projectors may consider most suitable for the object proposed, but their sides and decks must be protected with an iron armature sufficient to resist the heaviest shot and shells.

The vessels for the Mississippi River and tributaries are not to draw more than six feet water when fully equipped and armed, at which draft they are to be able to maintain a permanent speed of nine knots per hour in still water, and carry sufficient coal in the bunkers for six days' steaming at that speed. Their armament will consist of not less than six eleven-inch guns.

The vessels for harbor defence are not to draw more than twelve feet water when fully equipped and armed, at which draft they are to be able to maintain a permanent speed of ten knots per hour in smooth water, and carry sufficient coal in the bunkers for seven days' steaming at that speed. Their armament will consist of not less than from two to four eleven-inch guns.

The vessels for coast defence are not to draw more than twenty feet water when fully equipped and armed, at which draft they are to be able to maintain a permanent speed of fifteen knots per hour at sea, and carry sufficient coal in the bunkers for twelve days' steaming at that speed. Their armament will consist of one or two fifteen or twenty-inch guns.

The guns of the vessels for harbor and coast defence are to train to all points of the compass without change in the vessel's position.

The propositions must state the number of vessels, subject to the election of the Department, which the party proposes to furnish complete in every respect, embracing armor plating, steam machinery and equipments of all kinds, ready for service, excepting only the ordnance and ordnance stores and provisions; the proposition must be accompanied by descriptions, specifications, drawings and models of such character that the work could be executed from them.

The place of delivery must be stated; the time within which the vessel or vessels are to be completed, and also the total sum to be paid for each.

It will be stipulated in the contract that one-fifth the total amount will be retained by the Government until sixty days after the reception of the vessel, in order to give it a trial, the remaining payments being made with due regard to the proper performance and progress of the work; the contract will also embrace forfeitures for failure to perform the conditions specified.

The bids must be accompanied by the guarantee required by law, that, if a contract is awarded, it will be promptly executed; and the names of the parties who are to become the sureties to the amount of the face of the contract will also be stated.

The Department will consider any other propositions that may be presented in which the draft of water above-named is not exceeded.

The Department will be at liberty to accept or reject any or all the propositions.

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The second part is approaching completion and will shortly be announced.

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THE AUBIN GAS-WORKS CO., OF ALBANY, N. Y., refer to the following Gas-Light Companies using their Works, to prove that Gas stocks can pay handsomely, and yet a rich and *cheap* Gas be made, viz.: Plattsburgh, Whitehall, Palmyra, Waterford, Bath, Amsterdam, Fort Plain, N. Y.; Rutland, Vt.; Flemington, N. J.; Smyrna and Dover, Del.; Jersey Shore and Pittston, Penn.; Greensboro and Salem, N. C.; Sorel, St. Hyacinthe, and Point Levi, Canada. Agents wanted to extend the sale of the Aubin Portable Gas-Works, unsurpassed for simplicity, safety and economy.

WOODEN PURIFYING TRAYS.

WOODEN TRAYS FOR GAS-PURIFIERS.—The subscriber manufactures the WOODEN TRAYS for GAS-PURIFIERS on the invention of Wm. Combe, *cut from solid wood*, which are found superior to the iron plates formerly used, as being cheaper and more durable. The public are cautioned against the statements of R. G. Hunt, saying he has a patent for the seive itself, published in the AMERICAN GAS-LIGHT JOURNAL, as wholly without foundation. The following letter is from the Commissioner of Patents:

U. S. Patent Office, Jan. 6th, 1862.

Sir—In the matter of interference between the application of Hunt and Combe for patent conically slotted wooden gas-purifiers, appealed from the decision of the Examiner, the Examiners-in-Chief have rendered a decision, bearing date Jan. 4th, 1862. *The Examiners-in-Chief affirm the decision of the Examiner rejecting the first claim of Rich'd G. Hunt, and reverse the decision of the Examiner, rejecting the application of Wm. Combe, assigned to N. O. Hawxhurst.*

Unless an appeal shall be taken from this decision of the Examiners-in-Chief within the next ensuing thirty days, a patent will be allowed to N. O. Hawxhurst, assignee of Combe.

Respectfully, D. P. HOLLOWAY,
Com. of Patents.

All orders for Solid Wood Trays executed at the shortest notice, on reasonable terms, by
JOHN L. CHEESMAN,
147 Avenue C, near 10th st., New York City.

CONICALLY SLOTTED SOLID Wood Trays for Gas-Purifiers.—Admitted to be the best, cheapest, and most durable seives for gas-purifiers ever used.

Secured by Letters Patent of the United States, both for the machinery used in the manufacture, and for the seive itself.

For sale on reasonable terms to Gas-Light Companies or Agents, on application, by letter, to the patentee, RICHARD G. HUNT,
631 Fourth st., near Avenue C,
New York City.

N. B.—All persons are warned against purchasing these seives of others who falsely pretend to have patents for them. Suits will be commenced immediately against all persons infringing my patents by using or making wooden sieves, but those who hereafter purchase from me can buy their seives cheap and will not be troubled by me on account of former purchases. R. G. H.

Gas-Works and Water-Works.

D. PARRISH, JR., is prepared to furnish estimates for Gas or Water Works, and to erect them on the most improved principles. Office, 1416 Arch st., Philadelphia.
WM. D. PARRISH. D. PARRISH, Jr.

WANTED.

GAS-WORKS WANTED TO LEASE.

The advertiser wishes to lease a Gas-Works, of at least two benches of retorts, situated within one hundred miles of New York city. A fair rent will be paid, and the best security given.
Address "Lessee," at Office of AMERICAN GAS-LIGHT JOURNAL, No. 89 Nassau street, New York, stating location and terms.

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T. G. ARNOLD, MANUFACUTRER OF
GAS-BURNERS,
AND IMPORTER OF SCOTCH TIPS,
No. 447 Broome Street,
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Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers, &c., &c.

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ADDISON POTTER,
WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE, ENGLAND,
Manufacturer of CLAY RETORTS, FIRE BRICKS, and every description of FIRE CLAY GOODS.

ELLIMAN BROTHERS, 217 PEARL Street, New York, Commission Merchants, Importers of
BELGIAN FIRE-CLAY GAS RETORTS,
Dealers in Tiles, Arch-Bricks, Furnace-Doors, MOUTH-PIECES, COVERS,
And all other Fittings, of the most approved patterns, for setting Clay Retorts.
SABBATON'S PATENT FURNACE-DOORS, & FRAMES,
Floyd's Patent Malleable Iron Retort Covers,
McKENZIE'S PATENT GAS EXHAUSTERS,
made by Addison Smith. Compensator-Valves, &c. Gas, Water, and Steam Tubes.

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JOHN NEWKUMET,
Manufacturer of all kinds of FIRE-BRICK, GAS-HOUSE TILES, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice.

PATENT PYRO-CLAY GAS RETORTS. THOMAS HOADLEY, Patentee, wishes to call the attention of Gas-Engineers to these
RETORTS.
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" " Cleveland, O.
" " Chicago, Ill.
THOS. HOADLEY,
Corner of Main and Mulberry Sts., Cleveland, O.

NEW YORK FIRE-BRICK Manufactory. (Branch Works at Kreischerville, Staten Island.)
B. KREISCHER & CO., office 56 Goerck street, corner Delancy street, New York.
GAS-HOUSE TILES and FIRE-BRICK of all shapes and sizes. FIRE MORTAR, CLAY, and SAND articles of every description made to order at the shortest notice. B. KREISCHER. M. MAURER, A. WEBER.

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THE CARBONIZED GAS COMPANY, No. 476½ BROADWAY, New York, respectfully inform the public, that they are now prepared to supply GWYNNE'S PATENT CARBONIZER, and guarantee by its use to make a saving of 33 per cent. of their gas bills, and at the same time to produce a better light than the city gas. By this process, we warrant that there will be no collections of Carbon in the pipes, a chief difficulty with other machines of the kind.

GAS-HOLDERS.

GASOMETERS, RETORT-HOUSE ROOFS, WATER-TANKS,
PURIFYING-BOXES, COAL-CARS, COKE BARROWS,
AND ALL KINDS OF
WROUGHT-IRON WORK FOR GAS AND WATER WORKS.
Manufactured by GEORGE W. KRAFT, Chestnut street wharf, West Philadelphia, Pa.

POOLE & HUNT, BALTIMORE, MD., are prepared to execute orders for
GAS-HOLDERS,
IRON-ROOF FRAMING,
And all other descriptions of
Iron Work for Gas-Works, Water-Pipes, and Heavy Castings, and Machinery generally.

HARRIS LOUDERBACK, FIRE-BRICK LAYER
AND GAS RETORT SETTER,
No. 1005 Clement Street, Philadelphia.

POST-OFFICE TOWNS IN THE UNITED STATES,

ARRANGED BY STATES AND COUNTIES,

Showing where Gas-Works and Water-Works are Wanted.

OHIO.

88 Counties, 1,959 Towns, 32 Gas-Works, 5 Water-Works.

(*Continued from page* 259.)

Harrison County.

Archer, Bowerston, *Cadiz* (c. h.,) Cassville, Cold Spring, Conotton, Deersville, Fife, Freeport, Germano, Harrisville, Hopedale, Jewett, Laceyville, Means, Moorefield, New Athens, New Rumley, Nottingham, Scio, Short Creek, Smyrna, Station 15, Tappan, Tippecanoe.

Henry County.

Beta, Colton, Damascus, Durand, Florida, Liberty Centre, *Napoleon*, (c. h.,) New Bavaria, Odessa, Ridgeland, Ridgeville Corners, Shunk, Texas.

Highland County.

Allensburgh, Bell, Berrysville, Buford, Carmel, Centrefield, Dallas, Dodsonville, East Monroe, Economy, Elmville, Fairfax, Greenfield, Highland, *Hillsborough*, (c. h.,) Home, Leesburgh, Lynchburgh, Marshall, Mowrystown, Nevin, New Corwin, New Market, New Petersburgh, North Uniontown, Paint, Pricetown, Rainsborough, Russell's Station, Samantha, Sicily, Sinking Spring, Sugar Tree Ridge, Willettville.

Hocking County.

Ash Cave, Black Jack, Ewing, Gibesonville, Gore, Hocking Furnace, Islesboro', *Logan*, (c. h.,) Middle Fork, Rock House, South Bloomingville, South Perry, Starr.

Holmes County.

Benton, Berlin, Black Creek, Holmesville, Humphrey's Villa, Killbuck, *Millersburgh*, (c. h.,) Mount Hope, Nashville, Plimpton, Salt Creek, Saltillo, Walnut Creek, Winesburgh.

Huron County.

Bellevue, Bronson, Carson, Centreton, Clarksfield, East Clarksfield, East Townsend, Fitchville, Four Corners, Greenwich Station, Hartland, Havana, Monroeville, New Haven, New London, North Fairfield, *Norwalk*, (c. h.,) Olena, Peru, Pontiac, Sherman, Steuben, Wakeman.

Jackson County.

Agatha, Berlin Cross Roads, Buck Eye Furnace, Camba, Clay, Cove, Dawkin's Mills, Hays, Iron Valley, *Jackson*, (c. h.,) Jackson Furnace, Keystone, Levi, Mabee's, Oak Hill, Ray's, Rocky Hill, Samsonville.

Jefferson County.

Adena, Amsterdam, Annapolis, Bloomingdale, Cope's Mills, Cross Creek, Croxton, East Springfield, Elliottsville, Hammondsville, Holmes' Mill, Island Creek, Jeddo, Knoxville, Linton, Mitchell's Salt Works, Moore's Salt Works, Mount Pleasant, Nebo, New Alexandria, New Somerset, Phillipsburgh, Port Homer, Richmond, Rush Run, Smithfield, *Steubenville*, (c. h.,) Unionport, Updegraffs, Warrenton, Wintersville.

Knox County.

Bladensburgh, Brandon, Centreburgh, Danville, Democracy, Fredericktown, Gambier, Greersville, Jelloway, Knox, Levering, Lock, Lucerne, Martinsburgh, Milfordton, Millwood, Monroe Mills, Mount Liberty, *Mount Vernon*, (c. h.) Nonpareil, North Liberty, Shaler's Mills, Wolf.

Lake County.

Concord, Hillhouse, Kirtland, Madison, Mentor, *Painesville*, (c. h.,) Perry, South Kirtland, Unionville, Wickliffe, Willoughby.

Lawrence County.

Aid, Arabia, Athalia, Bartramville, *Burlington*, (c. h.,) Campbell, Coal Grove, Dickerson Forge, Greasy Ridge, Hanging Rock, Ironton, Israel, Kelly's Mills, Kennedy's Cross Roads, Miller's, Olive Furnace, Quaker Bottom, Rock Camp, Russell's Place, Scott Town, Simmons, South Point, Symmes Run, Willow Grove.

Licking County.

Alexandria, Appleton, Beech, Brownsville, Chatham, Clay Lick, Columbia Centre, Croton, Etna, Fallsburgh, Fredonia, Granville, Gratiot, Green, Hanover, Hawk Eye, Hebron, Homer, Jacksontown, Jersey, Johnstown, Kirkersville, Linnville, Long Run, *Newark*, (c. h.,) New-way, Outville, Pataskala, Perryton, Rocky Fork, Saint Louisville, Toboso, Utica, Vanatta, Wilkins' Run.

Logan County.

Belle Centre, Bellefontaine, Bloom Centre, De Graff, East Liberty, Harper, Huntsville, Lewistown, Loganville, Muchinippe, New Richland, Pickereltown, Quincy, Rushsylvania, West Liberty, West Middleburgh, Zanesfield.

Lorain County.

Amherst, Avon, Avon Lake, Black River, Crandall, *Elyria*, (c. h.,) Grafton, Henrietta, Oberlin, Penfield, Pittsfield, Plato,

Brighton, Brownhelm, Camden Station, Columbia Station, Copopapa, Huntington, La Grange, La Port, North Camden, North Eaton, North Ridgeville, Rawsonville, Rochester Depot, Sheffield, Sheffield Lake, Wellington,

Lucas County.

Hardy, Hickong, Java, *Maumee City*, (c. h.,) Monclova, Providence, Riga, Swanton, Sylvania, Toledo, Utah, Waterville, White House.

Madison County.

Big Plain, Cross Roads, Darby Creek, La Fayette, *London*, (c. h.,) Mount Sterling, Rosedale, South Sodon, Summerford, Tradersville, Wahoo, Walnut Run, West Canaan, West Jefferson.

Mahoning County.

Berlin Centre, Boardman, Boswell, *Canfield*, (c. h.,) Coitsville, Cornersburgh, East Lewistown, Ellsworth, Frederick, Greenford, Hanna's Mills, Lowellville, Milton, New Albany, New Middletown, New Springfield, North Benton, North Jackson, North Lima, Orange, Patmos, Petersburgh, Poland, Smithfield Station, Steamtown, Youngstown.

Marion County.

Big Island, Caledonia, Cochranton, Green Camp, Larue, Letimberville, *Marion*, (c. h.,) New Bloomington, Prospect, Three Locusts, Underwoods, Waldo.

Medina County.

Abbeyville, Brunswick, Chatham Centre, Crawford's, Granger, Guilford, Hinckley, Homersville, Leroy, Litchfield, Liverpool, Lodi, Mallet Creek, *Medina*, (c. h.,) Remson's Corners, River Styx, Sharon Centre, Spencer, Wadsworth, Weymouth, Whittlesey.

Meigs County.

Alfred, Apple Grove, Bashan, Burlingham, *Chester*, (c. h.,) Dexter, Downington, Great Bend, Harrisonville, Hemlock Grove, Langsville, Ledlie's, Letart Falls, Long Bottom, Middleport, Minersville, Mount Blanco, *Pomeroy*, (c. h.,) Oliver Centre, Portland, Racine, Rutland, Salem Centre, Silver Run, Syracuse, Tupper's Plains, Turner, Valley Ford.

Mercer County.

Boetia, Carthagena, *Celina*, (c. h.,) Chickasaw, Cold Water, Cranberry Prairie, Fort Recovery, Macedon, Marcellus, Maria Stein, Mendon, Mercer, Montezuma, Neptune, Reservoir, Saint Henry's, Shane's Crossings, Skeel's Cross Roads.

Miami County.

Allen's, Brandt, Casstown, Conover, Covington, Fidelity, Fletcher, Hyattsville, Laura, Ludlow, North Clayton, Peterson's Station, Piqua, Pleasant Hill, *Troy*, (c. h.,) West Charleston, West Milton.

Monroe County.

Antioch, Beallsville, Berne, Calais, Centre View, Enoch, Graysville, Hannibal, Hope Ridge, Jolly, Laing's, Lecompton, Lewisville, Malaga, Masterton, Miltonsburgh, Mount Carrick, Ozark, Rocky Narrows, Rouud Bottom, Sardis, Stafford, Sunfish, Wittens, *Woodsfield*, (c. h.)

Montgomery County.

Alexandersville, Brookville, Centre, Centreville, Chambersburg, Clayton, *Dayton*, (c. h.,) Dodson, Farmersville, Fishburgh, Germantown, Harshmansville, Hay's Store, Henby, Jonhsville, Liberty, Little York, Miami City, Miamisburgh, New Lebanon, Pyrmont, South Arlington, Taylorsville, Union, Vandalia, West Baltimore.

Morgan County.

Bristol, Chester Hill, Deavertown, Elliott's Cross Roads, Hall's Valley, Log Cabin, *McConnellsville*, (c.h.) Malta, Meigs' Creek, Meigsville, Mill Grove, Moscow Mills, Neelysville, Pennsville, Pleasant Valley, Reinersville, Ringgold, Rokeby, Rosseau, Roxberry, Stockport, Todd's, Triadelphia, Wolf Creek, Wood Grove.

Morrow County.

Andrews, Bennington, Bloomfield, Cardington, Chesterville, Corsica, Gray's Corners, Iberia, Indigo, Lincoln, McEwen's Cross R'ds, Marengo, Marit's, Mount Gilead, Nimmon's Cross R'ds, Pulaskiville, Shuack's, Sparta, Vail's Cross Roads, Westfield, Whetstone, Woodview.

Muskingum County.

Adams' Mills, Adamsville, Blue Rock, Bridgeville, Chandlersville, Coal Dale, Cottage Hill, Dresden, Duncan's Falls, East Greenwood, Frazeysburgh, Freeland's, Fultonham, High Hill, Hopewell, Irville, Licking Valley, Meadow Farm, Muse, Nashport, New Concord, Newton, Norwich, Otsego, Philo, Putnam, Rich Hill, Rix's Mills, Roseville, Rural Dale, Sago, Saintfield, Shannon, Sonora, Stovertown, Symmes Creek, West Zanesville, White Cottage, Young Hickory, *Zanesville*, (c. h.)

Noble County.

Ava, Caldwell, Claytona, Crooked Tree, Gardner, Harriettaville, Hiramsville, Hoskinsville, Keith's Kennonsburg, McCleary, Middle Creek, Mount Ephraim, Noblesville, Olive, Olive Green, Renrock, Sarahsville, Sharon, South Olive, Summerfield, Wharton's, Whigville.

Ottawa County.

Elmore, Genoa, Graytown, Locust Point, Marblehead, Martin, Ottawa, Ottawa City, Port Clinton.

Paulding County.

Antwerp, Charloe, Cranesville, Emmett, Hamer, Junction, McGill, Murat, Paulding, Payne, Reid's.

Perry County.

Asbury, Buchanan, Buck Eye Cottage, Chapel Hill, Dew Creek, East Rush Creek, Maxville, McCluney, Mount Perry, New Lexington, Oakfield, Pike, Portersville, Rehoboth, Sego, *Somerset*, (c. h.,) St. Joseph's College, Straitsville, Thornville, Whipstown, Worth.

Pickaway County.

Ashville, Beckett's Store, Camp Charlotte, *Circleville*, (c. h.,) Darbyville, Deer Creek, East Ringgold, Five Points, Hedges' Store, Kinderhook, New Holland, Palestine, South Bloomfield, Tarlton, Teegardin, Williamsport.

Pike County.

Beaver, Byington, Cynthiana, Flat, Gibson, Jasper, Lathem, Morgan's Fork, Omega, *Piketon*, (c. h.,) Waverly.

Portage County.

Atwater, Aurora, Brimfield, Charlestown, Deerfield, Edinburgh, Franklin Mills, Freedom, Garrettsville, Hiram, Mantua Centre, Mantua Station, Nelson, New Milford, Palmyra, Parisville, Randolph, Rapids, *Ravenna*, (c. h.,) Rootstown, Shalersville, Streetsboro', Suffield, Windham, Windham Station.

Preble County.

Camden, Campbelltown, *Eaton*, (c. h.,) El Dorado, Enterprize, Euphemia, Fair Haven, Gratis, Greenbush, Lewisburgh, Morning Sun, New Paris, New Westville, Sugar Valley, Upshur, West Alexandria, West Elkon, West Florence, West Manchester, West Senora.

Putnam County.

Belmore, Buck Eye, Dog Creek, Fort Jennings, Franconia, Gilboa, *Kalida*, (c. h.,) Leipsic, Medary, Pendleton, Pleasant, Sugar Ridge, Vaughnsville.

Richland County.

Adario, Barnes, Belleville, Butler, Ganges, Hastings, Lexington, Lucas, *Mansfield*, (c. h.,) Newville, Olivesburgh, Ontario, Plymouth, Riblet's, Richland, Rives, Shanandoah, Shelby, Six Corners, West Windsor.

Ross County.

Adelphi, Austin, Bainbridge, Bourneville, *Chillicothe*, (c. h.,) Clarksburgh, Frankfort, Gillespieville, Hallsville, Hooppole, Kingston, Lattas, Lyndon Station, Richmond Dale, Roxabell, Schooley's Station, South Salem, Waller, Yellow Bud.

Sandusky County.

Black Swamp, Clyde, Demassville, Exeter, *Fremont*, (c. h.,) Greensburgh Cross Roads, Rollersville, Townsend, West Fremont, Woodville.

Scioto County.

Brushy Fork, Franklin Furnace, Friendship, Hale's Creek, Haverhill, Iron Furnace, Junior, Lilly, Lucasville, Lyra, Nairn, *Portsmouth*, (c. h.,) Rarden, Scioto, Sciotoville, Wheelersburgh.

Seneca County.

Adams, Adrian, Attica, Bascom, Berwick, Bettsville, Bloomville, Butternut Ridge, Flat Rock, Fort Seneca.

(*To be continued.*)

LIGHT UP THE FORTS!—Where, in the world, are the builders of gas-works? Why is not Fort Lafayette lighted with gas? and Fortress Monroe, and Fort McHenry, and Fort Warren? These various establishments are filled with boarders who would much prefer the brilliancy of gas-light to the dim desolation of adamantines and coal-oil. Let the forts be lighted!

And the Navy Yard. Great complaint is made at the darkness of the ship-houses and work-shops at the various navy yards, all of which need a gas-works of their own.

We feel satisfied that upon a proper representation to the Secretary of the Navy and the Quartermaster General, all of these public establishments would be forthwith lit up.

COST OF COAL IN PARIS.—An exchange says: "Coal costs the Paris Gas Company a fraction of a franc above 20s. per ton, and the products return 10s., leaving 10s. as the net cost for coals for 8,754 feet of gas. The net cost of coal in London is about 8s. for 9,200 feet; the difference between the cost of coal in Paris and in London being about 3 1-4d. per 1,000 feet of gas in favor of London."

DANGER OF LEAD WATER-PIPES.

A correspondent of the New York *Herald* makes the following remarks in reference to the use of lead pipes for conveying water:

It is well known among physicians that lead introduced into the healthy human body induces cutaneous insensibility, paralysis of the extremities, convulsions, blindness, headache, colic, vomiting, and many other serious symptoms.

Since leaden pipe is almost universally used for conveying water into the dwellings of our cities, it becomes a question of vast importance to decide whether the water does not or may not convey deleterious ingredients into the systems of those who use it. Experiments upon this subject have sometimes indicated the possibility of danger as the most favorable view of this subject that can be taken, and at other times they have resulted in establishing an opinion in scientific minds that the use of leaden service pipe is always accompanied with danger.

We are not informed that the Croton Aqueduct Board have come to a different conclusion than they did in 1849, when they used the following language in their report:

"The department is aware of but a single case in which any precautions can be necessary in the use of the Croton water for drinking, and that is only at elevations where the supply is not constant. In the upper stories of buildings, where the pipes are alternately wet and dry, caused by the daily variations of heat, it is possible that the interior of the pipes, by the united action of air and water, may be so oxydized that particles of the carbonate of lead might be carried off, held in suspension by the water, and received into the stomach by drinking it. It would be imprudent, therefore, habitually to drink water from taps so circumstanced."

B. Silliman, Jr., analytical chemist, makes the following remarks:

"We confidently state that the passage of water through iron pipes, prepares it for a more speedy and certain action on lead. It must be admitted, however, that, as far as our present knowledge of facts goes, the cases of poisoning with lead in New York, have been rare exceptions; but the public attention has not yet been fully awakened to the subject."

The full force of the last remak is realized after reading the following extract from a "report on Lowell water," prepared by S. D. Dana, M. D., chemist:

"The fact so well known to our citizens, that leaden pipes are corroded and destroyed by well water, would long ago have told them the effects of using such water, were it not that the disorders produced by it are of such a slow and insidious character, that they have been attributed to other sources. That lead in continued small doses is a cause of disease and death, is the accumulated testimony of two thousand years."

The above opinions, coupled with the fact that there is a greater amount of impurity in Croton water flowing from the service pipes in the city then there is at the source, are sufficient to call for further examination into this subject, and if Dana's position is the true one, as the writer has reason to doubt, a substitute for lead should at once be accepted.

Gas-Light in Camp.—The Thirty-eighth Regiment of New York Volunteers, commanded by Col. Ward, now encamped on the Potomac, have, in order to beguile the tedium of camp life, erected a theatre, where dramatic performances are often represented. This building, which is of quite a substantial character, is lighted with gas, made in one of George H. Kitchen & Co's. gas-works, and is said to cost but a trifle. There are, in all, about one hundred and forty burners, including the chandeliers, and side and foot lights.

Reduction in the Price of Gas in Canada.—It is said that, in some of the cities of Western Canada, the price of gas has been reduced considerably, on account of the abundance and cheapness of coal oils and rock oil.

San Francisco, Cal.—A meeting of the stockholders of the San Francisco Gas Co., for the purpose of increasing the amount of their capital stock to two millions of dollars, was held on 20th ult.

EXPLOSION OF BENZINE.

On the afternoon of February 27th, a terrific explosion of benzine occurred in a varnish factory in Philadelphia. The building where the explosion occurred was a three-storied brick structure, and was originally constructed for two dwelling-houses, but was subsequently converted in a manufactory of japan varnish. Between the main and the back buildings was a double partition wall. The furnaces for boiling the varnish were in the last mentioned place. In the front building was a large tank for receiving the varnish after it was boiled, and which was conveyed through a pipe. At the time the accident occurred, varnish was being boiled in a kettle about six feet in diameter, the contents of the kettle took fire, and a terrific explosion ensued, shaking the surrounding houses for several squares, and completely demolishing the whole building, nothing being left standing except the partition wall between the two buildings.

At the time the accident occurred two men were in the place, one of whom was Mr. James S. Wright, the proprietor. The other was a German, named Herbott, who was sitting on the floor, engaged in cleaning a pan near the large kettle in which the varnish was boiling. Herbott was blown out of the building, and fell on the pavement. When he recovered from the shock, he raised himself up against a fence till assistance arrived. He was immediately conveyed to a drug store, where his injuries were attended to, after which he was conveyed to his residence. His life may be saved, although his situation is very critical.

At the time of the explosion, Mr. Wright was in the front part of building, on the lowest floor. About twenty minutes after the explosion, his body was found buried under the ruins. When lifted, he breathed a few times and expired.

The varnish in the kettle flowed over the ruins of the building, setting fire to the woodwork and causing an alarm of fire. The flames were soon extinguished by the firemen, and before any of the neighboring buildings had been injured. The proprietor being killed, and Herbott being only employed to do the hauling from the factory, it is difficult to account for the accident satisfactorily. Herbott says only that he heard a kind of hissing noise, followed by a loud explosion. He saw the building falling around him, and only recovered consciousness to find himself leaning against the fence, as before related. He says that Mr. Wright had always used turpentine in the manufacture of varnish until within a few days, when he determined to try the experiment of using benzine. Mr. Wright said he knew of the danger attending the use of this combustible, but thought that, with attention, any accident might be avoided. The kettle which exploded contained about three barrels of benzine.

COLZA OIL FOR LIGHTHOUSES.

Soon after the organization of the Lighthouse Board, measures were taken to introduce colza oil, or the finer varieties of rape-seed oil. This oil has long been used for illuminating purposes in Europe, and to a limited extent in this country. There are several plants which produce colza oil, and which are adapted to cultivation in the northern and western states. Among these are the *Brassica oleracea*, (wild cabbage) *B. præcox*, (summer rape,) *B. napus*, (winter rape,) &c. A quantity of the seed of the wild cabbage was recently imported by the Board, and distributed directly or through the Patent Office.

In 1861, 5,000 gallons of this oil were offered at $1 10 per gallon, and used in the lighthouses on the lakes. It stood the severest scrutiny as to its economical employment, and no complaints were made of it. For the coming year 2,000 gallons have been purchased at $1 per gallon, and 10,000 gallons at $1 10. These bids were from the State of Wisconsin, where the oil was manufactured, and being so near the lakes, where it is all used, a large saving was effected in transportation. Nearly 65 cents per gallon were saved in this way, over the market price of sperm oil, which was formerly used in its place. In 1851, some objections were urged against the adoption of colza oil for lighthouse service, on the ground of its being liable to deteriorate on being kept any length of time; but it having been demonstrated that when properly prepared it may be stored for years, all the objections were not permitted to interfere with its use.

The manufacture of colza oil is one of some magnitude in Europe, and requires—when conducted on any considerable scale—a large amount of apparatus. The seeds of the plant are the oil-bearing material. These are gathered and submitted to pressure, by which the hard integument of the seed is broken. Care must be exercised in the first stage of the manufacture, to select old seeds, or those in which, by previous treatment, the albumen or mucus matters are rendered more sparingly soluble than in the perfectly fresh seeds. The cake resulting from the first pressure, is ground into a flour, to which sometimes a little water is added. It is then heated to make the particles of oil more limped, and being placed in bags, is subjected to intense pressure. In England the hydraulic press is generally used, but in other parts of Europe the old fashioned wedge press is employed. After the cake is exhausted of its oily constituent, the latter is clarified and is ready for the market. The different varieties of *Brassica* yield from 16 to 50 per cent. of oil, but 30 to 33 may be taken as a fair average.

Manchester, N. H.—The Manchester Gas-Light Co. sell their coke, delivered in any part of the city, for $3 50 per chaldron, in quantities of half a chaldron and over. In less quantities, 10 cents a bushel at the works, delivery extra.

PUBLIC LIGHTING IN THE BRITISH PROVINCES.

Prepared for the Managers of the Metropolis Gas Inquiry by Samuel Hughes, *Honorary Engineer to the Managers.*

TABLE SHOWING THE PRICES PAID FOR PUBLIC LIGHTING IN A NUMBER OF PRINCIPAL TOWNS IN THE UNITED KINGDOM.

The tenth column of the table shows the price per 1,000 feet paid for gas alone in the public lamps, compared with the price paid by the private consumer as contained in the eleventh or last column.

Attention is requested particularly to the cases of Belfast, Bilston, Birmingham, Bradford, Brighton, Cambridge, Carlisle, Coventry, Dover, Huddersfield, and many others, where the price for gas in the public lamps is extremely small as compared with that paid by the private consumer.

The number of feet burnt by the public lamps, as contained in the sixth column, is, in most cases, the quantity contracted for by the local authority; but of course it is matter of considerable doubt whether anything like this quantity is supplied.

On this subject experiments are required similar to those which have been made in some of the London parishes.

The following table contains about seventy towns, this being the whole number from which complete returns have been obtained up to this time.

In all these the average price paid for the gas alone supplied to public lamps amounts to 75 per cent. of the price paid by the private consumer.

I have recently examined returns from no less than ninety-one cities and towns in America. In fifty-four of these the local authorities light and extinguish their own lamps. In thirty-three out of the whole number the gas consumed by public lamps is paid for at a price per 1,000 feet; and an accurate analysis has shown that, in several cases, the price paid for the gas in the public lamps is only half of that paid by the private consumer.

The average of the whole thirty-three towns gives the price of gas in the public lamps equal to 75 per cent. of that paid by the private consumer, showing a remarkable coincidence with the result obtained from a similar extensive examination in Great Britain.

The managers have determined to publish this table of public lighting in provincial towns as throwing further light on this important question, in the belief that it will diffuse throughout the metropolis and the country generally, more accurate and trustworthy information on this subject than any that has hitherto been circulated.

Printed by order of the Managers,

James Beal,
Hon. Sec.

PUBLIC LIGHTING IN THE BRITISH PROVINCES.

Name of City or Town.	Price paid for each public Lamp per annum.	To whom the Lamps belong.	Who lights, extinguishes, paints, and repairs.	Number of hours per annum during which each lamp burns.	Cubic feet per hour consumed by each lamp as per cont'ct	Deduction for use of lamps, lighting, extinguishing, repairing, &c.	Price paid for gas alone pr. lamp pr. annum.	Cubic feet of gas consumed by each lamp per annum.	Price paid per 1000 feet for gas alone in public lamps.	Price pr. 1000 ft. paid by private consumers.	REMARKS.
1	2	3	4	5	6	7	8	9	10	11	
	s. d.	*	†			s. d.	s. d.		s. d.	s. d.	
Aberdeen	4 7 *a*	T	T	....	¾	None.	4 7	...	6 1	6 6 *b*	*a* Price per 1,000 hours. *b* With discounts.
Airdrie	10 6	T	T	933	2 1-7	None.	10 6	2000	5 3	5 10	
Arbroath	5 2½ *a*	T	T	....	1	None.	5 2¾	1275	5 2¾	5 10	*a* Price per 1,000 hours.
Ayr	5 0 *a*	T	T	....	1	None.	5 0	....	5 0	6 8	*a* Price per 1,000 hours.
Banbury	56 3	Co.	Co.	2250	5	13 0	43 3	11250	3 10	5 0	
Do.	50 7	Co.	Co.	2025	5	12 7	38 0	10125	3 9	5 0	
Bath	60 0	Co.	Co.	3650	4	16 0	44 0	14600	3 0	4 6	
Belfast	45 0	Co.	Co.	3620	4	10 0 *a*	35 0	14480	2 5	4 2 *b*	*a* The lamp posts belong to the town, and are painted by the town. The lanterns and brackets belong to the Company. *b* With discounts varying from 2½ to 20 per cent.
Bilston	48 0	T	Co.	2130	5	7 0 *a*	41 0	10650	3 10	5 6 *b*	*a* The town paints and repairs. *b* Price reduce to 4*s.* 6d., according to consumption.
Birmingham	70 0 *a*	T	Co.	3939	5	13 0	57 0	19695	2 11	4 0 *b*	*a* The contract specifies a flame 4" by 2". *b* With discounts up to 25 p.c.
Blackburn	33 4	T	T	2486	4	None *a*	33 4	9944	3 4	4 0 *b*	*a* The lighting, repairing, &c., cost the town 9*s.* 4*d.* per annum. *b* The price is 3*s.* 9d. to large consumers.
Bolton	37 4	T	Co.	1781	3½	7 6 *a*	29 10	6233	4 9½	5 0 *b*	*a* The town paints and repairs.
Do.	29 2	T	Co.	1781	2½	7 6 *a*	21 8	4452	4 10½	5 0 *b*	*b* With discounts of 20 per cent. if paid within 14 days. Gas made from two-fifths common and three-fifths cannel coal.
Do.	23 7	T	Co.	1781	1 6-10	7 6 *a*	16 1	2850	5 7¾	5 0 *b*	
Bradford	48 6	T	Co.	3970	4	10 0 *a*	38 0	15880	2 4¾	4 0 *a*	*a* The Town Council paints and repairs.
Bristol	80 0	T	Co.	3613	5	13 0	67 0	18065	3 8¼	4 0	*a* The price is 3*s.* 9*d.* to one or two large consumers.
Brighton	80 0	T	Co.	4304	5	10 0	70 0	21520	3 8	5 0	
Cambridge	80 0	Co.	Co.	4304	4½	16 0	64 0	19368	3 3¾	5 6 *a*	*a* Price to be reduced to 5*s.* at Lady Day, 1859.
Cardiff	66 0	T	Co.	3600	4½	13 0	53 0	16200	3 3½	4 3 *a*	*a* Price reduced to 3*s.* 6*d.*, according to consumption.
Carlisle	53 0	Co.	Co.	3600	5	16 0	37 0	18000	2 0¾	4 2	Gas made from common coal with 7½ per cent. of cannel. Illuminating power, 15 sperm candles. The works belong to the Corporation.
Do.	42 0	Co.	Co.	3600	3½	16 0	26 0	12600	2 0¾	4 2	
Do.	31 0	Co.	Co.	3600	2	16 0	15 0	7200	2 1	4 2	
Cheltenham	77 6	Co.	Co.	3684	4½	16 0	61 6	16578	3 8½	5 0	
Chester	60 0	Co.	Co.	3650	3	16 0	44 0	10950	4 0¾	4 6	
Do.	69 4	Co.	Co.	3650	4	16 0	53 4	14600	3 7¾	4 6	
Do.	50 0	Co.	Co.	3080	3	16 0	34 0	9240	3 8¼	4 6	
Do.	63 9	Co.	Co.	3080	4	16 0	47 0	12320	3 9¾	4 6	
Chichester	100 0	Co.	Co.	4304	5	16 0	84 0	21520	3 10¾	6 8	
Colchester	65 0	T	Co.	2700	4 1-10	10 0	55 0	11070	4 11¾	6 0	
Coventry	50 0 *a*	Co.	Co.	3100 *a*	5 *a*	16 0	34 0	15500	2 2¼	4 6	*a* Price, consumption, and time of burning fixed by Act of Parliament.
Derby	54 3 *a*	T	T	3729 *a*	5	None.	54 3	18645	2 11	3 9 *b*	*a* Winter lamps. *b* Price gradually descends to 3*s.* 1½*d.*, according to consumption.
Do.	30 4 *a*	T	T	2075 *a*	5	None.	30 4	10375	2 11	3 9 *b*	*a* Summer lamps. *b* Price gradually descends to 3*s.* 1½., according to consumption.
Dover	63 0	Co.	Co.	4164	4½	16 0	47 0	18738	2 6	5 10 *a*	*a* With discounts varying from 10 to 20 per cent. if accounts paid within six months.
Do.	35 0	Co.	Co.	4164	2½	16 0	19 0	10410	1 10	5 10 *a*	
Dublin	64 6	Co.	Co.	8510	4	16 0	48 6	14040	3 5¼	4 9	
Dumfries	6 9 *a*	T	T	....	3	None.	6 9	....	6 9	7 6 *b*	*a* Price per 1,000 feet. *b* With discounts from 0 to 10 per cent.
Dundee	4 2 *a*	T	T	....	9-10	None.	4 2	....	4 7	5 6	*a* Price per 1,000 hours.
Dunfermline	4 5 *a*	T	T	....	2	None.	4 5	....	4 5	5 2½ *b*	*a* Price per 1,000 feet. *b* With discounts varying from 0 to 15 per cent.
Edinburgh	15 0	T	T	3926	1	None.	15 0	3926	3 9¼	5 10 *a*	*a* Price lately reduced to 5*s.* 5*d.*, with discounts from 5 to 10 per cent.
Do.	59 0	T	T	3926	....	None.	....	....	....	5 10 *a*	
Exeter	67 6	....	....	....	....	....	....	....	....	5 6	
Forfar	6 9 *a*	T	T	....	1	None.	6 9	....	6 9	7 6 *b*	*a* Price per 1,000 hours. *b* With discounts varying from 2½ to 20 pr. ct.
Glasgow	29 2	T	T	3446	2	None.	29 2	6892	4 2¾	5 0	
Gloucester	95 0	Co.	Co.	....	....	....	....	....	....	5 0	
Greenock	52 6	T	T	3842	3	None.	52 6	11526	4 6¾	5 0 *a*	*a* With discounts varying from 2½ to 20 per cent.
Do.	35 0	T	T	3842	2	None.	35 0	7684	4 6¾	5 0 *a*	
Halifax	32 0	T	T	4304	5 *a*	None.	32 0	21520	1 5¾	4 0	Works belong to the Corporation. *a* Quantity not specified.
Huddersfield	34 0	T	T	3750	3½	None.	34 0	13125	2 7	4 0	The lighting, cleaning, and extinguishing are let by tender, at 8*s.* per lamp per annum.
Inverness	26 6 *a*	T	T	1648	2	None.	26 6	3296	8 0½	8 4	*a* Average price per lamp.
Ipswich	65 0	Co.	Co.	3577	5	15 0	50 0	17885	2 10	5 6	
Irvine	21 0	T	Co.	2664	2	9 0	12 0	5328	2 3	5 10	
Kilmarnock	5 0 *a*	T	T	....	1	None.	5 0	....	5 0	5 10 *b*	*a* Price per 1,000 feet. *b* With discounts varying from 5 to 10 per cent.
Kingston-upon-Hull	90 0	Co.	Co.	4000	5	16 0	74 0	20000	3 8¾	5 0 *a*	*a* Price in the East District. The town is lighted by three Companies.
Do.	80 0	T	Co.	4000	5	13 0	67 0	20000	3 4¼	4 6 *a*	*a* Price in the Old Town.
Do.	75 0	Co.	Co.	4000	5	16 0	59 0	20000	2 11½	4 6 *a*	*a* Price in the West District.
Lancaster	....	Co.	....	2520	4	....	....	10080	....	5 6	
Leeds	35 6 *a*	T	T	3255	3	None.	35 6	9765	3 7¼	4 6	*a* The average price.
Leicester	3 11 *a*	T	T	1000	4	None.	3 11	1000	3 11	4 8 *b*	*a* Price per 1,000 feet for gas burnt in public lamps, with 5 per cent. discount. The quantity ascertained by meter. *b* Private consumers will be charged 4*s.* 5*d.*, from June, 1859, till September, 1859; and 4*s.* 2d. per 1,000 feet after September, 1859.
Leith	15 0	T	T	3926	1	None.	15 0	3926	3 9¾	5 5	
Lincoln	63 0	....	....	1800	5	....	....	9000	....	....	
Lichfield	37 6	Co.	Co.	1002	5	18 0	24 6	5010	4 10½	6 0	Lamps burn on the average six hours per night from first Saturday in September to the last in April, excepting nine nights in each lunar month. No stipulation as to quantity.
Liverpool	71 7 *a*	T	Co. *a*	3618	4	12 7 *b*	59 0	14472	4 1	3 9	*a* This price is based on the supposition that lighting, extinguishing, and repairing costs 17*s.* 3*d.* per lamp. *b* The Corporation paints the lamp-posts.
Macclesfield	39 0	T	Co.	2400	4	7 6	31 6 *a*	9600	3 3¼	4 6	*a* The Company lights and extinguishes. The town paints and repairs.
Manchester	35 4	T	T	3687	2¼	None.	35 4	10902	3 6½	5 0 *a*	*a* Price reduced to 4*s.*, according to consumption.
Montrose	15 8	T	T	1256	2 4-10 *a*	None.	15 8	3014	5 2	5 6	*a* Actual consumption by experiment.
Do.	6 7	T	T	1256	1 *a*	None.	6 7	1256	5 3	5 6	*a* Ditto ditto. Cannel gas.—Lamps burn from sunset till 11 P. M. from 1st September to 31st March.
Northampton	79 4 *a*	Co.	Co.	2681	5	12 4	67 0	13405	5 0	5 0 *c*	*a* Croll's award in 1853. *b* Hughes and Eunson's award in 1859. *c* With discount of 10 per cent. to large consumers.
Do.	65 11 *b*	Co.	Co.	2681	5	12 4	53 7	13405	4 0	5 0 *c*	
North Berwick	....	....	....	....	....	....	....	....	....	9 2	
Norwich	78 6 *a*	Co.	Co.	3574	5	16 0	62 6	17870	3 6	4 6 *a*	*a* With a discount of 5 p. c. when the acc. amounts to £50 per annum.
Do.	88 6 *a*	Co.	Co.	3574	5	16 0	72 6	17870	4 0¼	4 6	*a* Price now demanded by the Company.
Newark	50 0	Co.	Co.	1700	5	13 0	37 0	8500	4 4¾	5 0 *a*	*a* The price is 4*s.* 7*d.* to consumers of 15,000 feet in a summer quarter, or 30,000 in a winter quarter, with a discount of 10 per cent. to consumers of more than 200,000 feet per annum.
Oldham	47 6	....	....	3053	....	....	....	....	....	....	
Oxford	57 6	T	Co.	2468	4½	10 0	47 6	11106	4 3¼	5 0	Said to burn 5 feet per hour.
Paisley	5 0 *a*	T	T	....	1	None.	5 0	....	5 0	5 0	*a* Price per 1,000 feet.
Perth	17 4½	T	T	1705	2 *a*	None.	17 4½	3410	5 1¾	7 6	*a* The consumption ascertained by meter.
Plymouth	75 0	T	Co.	4304	4 *a*	13 0	62 0	17216	3 7¼	4 0	*a* Consumption as ascertained by 6 meters—17,100 c. f. per annum.
Preston	41 6	T	T	3071	4	None.	41 6	12284	3 4½	4 9½ *a*	*a* With discounts varying from 10 to 30 per cent., if account paid within a month after delivery.
Rochdale	13 0	....	....	2351	3 7-10	....	....	8699	....	4 0	
Saint Ives	50 7	T	T	2500	4¼	None.	50 7	11250 *a*	4 6	6 8	*a* Consumption ascertained by meter attached to one lamp in 12.
Salford	12 6 *a*	T	T	1000	3¼	None.	12 6	3500	3 6¾	4 6 *b* / 5 0 *c*	*a* Price per 1,000 hours. Time of burning varies from 2,800 to upwards of 3,000 hours. *b* Price in the borough, decreasing to 4*s.* according to consumption. *c* Price out of the borough, decreasing to 4*s.* 6*d.* according to consumption.
Sheffield	49 9	Co.	T	2735½	5	None.	49 9	13677½	3 7¾	4 0 *a*	*a* Reduced to 3*s.* 6*d.* per 1,000 feet to consumers who burn more than 500,000 feet per annum.
Shrewsbury	72 6	Co.	Co.	3285	5	16 0	56 6	16425	3 5¼	5 0 *a*	*a* 4*s.* to large consumers.
Do.	39 6	Co.	Co.	3285	2	16 0	23 6	6570	3 7	5 0	
Southampton	87 0 *a*	T	Co.	3757	4	13 0	74 0	15028	4 11	5 6	*a* Average price.
South Shields	1 2½ *a*	....	....	....	....	....	....	....	....	4 0	*a* Price per week for each public lamp.
Stamford	53 0	Co.	Co.	1800	4½	13 0	40 0	8100	4 11¼	5 6	
Stirling	30 0	T	T	....	....	....	....	....	....	6 0	
Sunderland	56 3	T	Co.	3184½	5	7 6 *a*	48 9	15922½	3 0¾	4 0	*a* Corporation paints and repairs. Lamps lighted during 9 months only.
Swansea	70 0	....	....	....	....	....	....	....	....	5 0 *a*	*a* 4*s.* 6*d.* to large consumers.
Tottenham	80 0	T	Co.	3195	5	10 0 *a*	70 0	15975	4 5	6 0 *b*	*a* The Company lights and extinguishes. The town paints and repairs. *b* With discount of 6*d.* per 1,000 if paid within a month.
Tynemouth	45 0	T	Co.	3566	....	10 0 *a*	....	....	....	4 0	*a* The Company lights and extinguishes. The town paints and repairs.
Walsall	60 0	Co.	Co.	2100	7	13 0	47 0	14700	3 2¼	3 4 *a*	*a* The price decreases to 2*s.* 10*d.*, according to consumption. The works belong to the Corporation.
Wellington	42 0	T	Co.	1800	*b*	7 0 *a*	35 0	....	....	5 0 *c*	*a* The town paints and repairs the lamp-posts. *b* No contract as to quantity. *c* With discounts.
Whitehaven	48 0	T	Co.	4304	5	12 0	36 0	21520	1 8	2 6 *a*	*a* Price charged by new Company. The old Company charges only 2*s.* per 1,000.
Do.	35 6	T	Co.	3572	5	9 6	26 0	17860	1 5½	2 6 *a*	
Do.	25 0	T	Co.	3572	2½	9 6	15 6	8930	1 8¾	2 6 *a*	
Wigan	31 6	Co.	Co.	2000	....	13 0	18 6	....	....	5 0 *a*	*a* With 25 per cent. discount if paid within a month.
Wolverhampton	74 0	Co.	Co.	3391	5	16 0	58 0	16955	3 5	4 9 *a*	*a* 4*s.* 3*d.* to large consumers.
York	2 6 *a*	Co.	Co.	uncertain.	5	....	....	....	....	5 0	*a* Price per 100 hours. Same as to private consumers, but the Company lights, extinguishes, paints, and repairs; and lamps belong to Company.

* T means the Town Council, Corporation, or other Local authority.

† Co. means the Gas Company.

ON THE FORMATION OF PETROLEUM AND ALLIED SUBSTANCES FROM WOODY FIBRE OR ANIMAL TISSUE.*

We have stated in the preceding paper, that the different mineral combustibles have been derived from the transformations of vegetable matters, or in some cases of animal tissues analagous to these in composition. The composition of woody fibre or cellulose, in its purest state, may be represented by $C_{24}H_{20}O_{20}$, or as a compound of the elements of water with carbon: the incrusting matter of vegetable cells, to which the name of lignine has been given, contains, however, a less proportion of oxygen and more carbon and hydrogen than cellulose, so that the mean composition of recent woods, as deduced from numerous analyses of various kinds, may be represented by $C_{24}H_{18\cdot4}O_{16\cdot4}$. We may conceive of four different modes of transformation of woody fibre all of which probably intervene to a greater or less degree in the production of mineral combustibles; and in considering these changes, we shall, for greater simplicity, adopt for the composition of woody fibre the first-named formula, $C_{24}H_{20}O_{20}$.

I. When wood is exposed to the action of moist air, oxygen is absorbed, and carbonic acid and water are evolved in the proportion of one equivalent of the first for two of the last. We may suppose that for H_2 which is oxydised by O_2 from the air, the wood loses CO_2, so that while the carbon increases in amount, the proportions of oxygen and hydrogen are unchanged. In this way an equivalent of cellulose, by absorbing sixteen equivalents of oxygen and losing eight of carbonic acid, (8 CO_2) and 16 of water, (16 HO) would leave $C_{16}H_4O_4$. Such is the nature of the decay of wood when exposed to the air, and the process, could it be carried out, would leave a residue of carbon only. If, however, the wood is deeply buried and excluded from the oxygen of the air, two reactions are conceivable.

II. The whole of the oxygen of the wood may be given off in the form of carbonic acid, while the hydrogen remains with the residual carbon. The abstraction of ten equivalents of carbonic acid from one of woody fibre, would leave a hydrocarbon, $C_{14}H_{20}$.

III. Instead of combining exclusively with the carbon, a part of the oxygen of the wood may be set free as water, in combination with the hydrogen. The abstraction from an equivalent of woody fibre of four equivalents of carbonic acid and twelve of water would leave a hydrocarbon $C_{20}H_8$.

IV. These decompositions are, however, never so simple as we have supposed in II. and III., for a portion of hydrogen is at the same time evolved in combination with carbon, chiefly as marsh gas, C_2H_4. The amount of this gas evolved from decaying plants submerged in water, and the immense quantities of it condensed in coal beds and other rocky strata, (forming fire damp,) show the great extent to which this mode of decomposition prevails.

In nature, these various modes of decomposition often go on together, or intervene at different stages in the decomposition of the same mass; they are, besides, seldom so complete as we have represented them. The first process results in the formation of vegetable mould, which always retains portions of carbon and hydrogen; while the incomplete operation of the process II., III., and 14, gives rise to peat, lignite, brown coal, bituminous coal, and pyroschists, in all of which the proportion of the oxygen is much less than the hydrogen, so that their composition may be approximately represented by mixtures of hydrocarbons with vegetable fibre. The following results have been selected from a great number of analyses by various chemists, and are for the most part taken from Bischof's *Chemical Geology*, (Vol. i. cap. 15.) The nitrogen, which in most cases was included with the oxygen in the analysis, has been disregarded, and oxygen and hydrogen, for the sake of comparison, have been calculated for twenty-four equivalents of carbon:

1. Vegetable fibre or cellulose.... $C_{24}H_{20}O_{20}$
2. Wood, mean composition..... $C_{24}H_{18\cdot4}O_{16\cdot4}$
3. Peat (Vaux)..... $C_{24}H_{14\cdot4}O_{10}$
4. Do. (Regnault) ..... $C_{24}H_{14\cdot4}O_{9\cdot6}$
5. Brown coal (Schrötter..... $C_{24}H_{14\cdot3}O_{10\cdot5}$
6. do. do. (Woskresensky)... $C_{24}H_{13}O_{7\cdot6}$
7. Lignite (Vaux)..... $C_{24}H_{11\cdot3}O_{5\cdot4}$
8. Lignite passing into mineral resin (Regnault) ..... $C_{24}H_{15}O_{3\cdot3}$
9. Bituminous coal (Regnault) ... $C_{24}H_{11}O_{3\cdot3}$
10. do. do. do. .... $C_{24}H_{10}O_{1\cdot7}$
11. do. do. do. .... $C_{24}H_{3\cdot4}O_{1\cdot2}$
12. do. do. do. .... $C_{24}H_2O_{0\cdot9}$
13. do. do. (Künert and Gräger)..... $C_{24}H_{7\cdot4}O_{1\cdot3}$
14. do. do. mean composition (Johnston)..... $C_{24}H_9O_2$—O_4
15. Albert coal (Wetherell)..... $C_{24}H_{15\cdot9}O_{1\cdot6}$
16. Asphalt Auvergne..... $C_{24}H_{17\cdot7}O_{2\cdot2}$
17. do. Naples..... $C_{24}H_{14\cdot6}O_2$
18. do. Bastennes..... $C_{24}H_{16}O_{0\cdot7}$
19. Elastic bitumen, Derbyshire, (Johnston)..... $C_{24}H_{22}O_{0\cdot3}$
20. Bitumen of Idria..... $C_{24}H_8$
21. Petroleum and naphtha..... $C_{24}H_{24}$

In the above table we see the transition from peat and brown coal to lignite, and thence to bituminous coal. Professor Johnston, from his experiments in various coals, including cannel from Wigan, splint coal from Workington, and caking coal from Newcastle, deduced the composition given in 14, in which, with $C_{24}H_9$ the oxygen varies from two to four equivalents. It will be seen from a comparison of the infusable Albert coal with the bitumens 16, 17, and 18, how gradual is the transitions to the true petroleums and naphthas, from which oxygen is absent. The asphalts, also, as will be observed, differ very much in their composition, and though generally much richer in hydrogen than the bituminous coals, the variety from Naples, (17) which is completely fusible at 140° C., contains less hydrogen and more oxygen than the Albert coal analysed by Wetherill; while the idrialine or bitumen found with the mercury ores of Idria, approaches very nearly in composition to the bituminous coals 11, 12, and 13, with which many asphalts may be said to be isomeric. It is, however, probable that those oxygenized bitumens, unlike the coals, are products of the oxydation of naphtha or petroleum, by a process similar to that by which resins are derived from vegetable hydrocarbons. These formulas must be taken as representing not the true equivalents, but only the proportions of the elements in the bodies in question, which are in most cases mixtures of various substances. This is especially true of naphtha, which may be taken as the representative of pure unoxydized petroleum, and which is separated by distillation into oils of very different boiling points. The late analyses by Uelsmann of the rectified rock oil from Schnde, near Hanover, gave the formula $C_{18}H_{20}$, and according to De la Rue and Müller, the greater part of the Rangoon petroleum consists of hydrocarbons in which the number of equivalents of hydrogen is a little greater than the carbon; one gave $C_{26}H_{28}$. Associated with these are, however, portions of bodies containing a less proportion of hydrogen, so that we may conceive the mean composition of petroleum to be represented, as in the preceding table, by equal equivalents of hydrogen and carbon; many forms of solid bitumen, also, as ozokerite and hatchetine, have the same general composition.

By referring to what has been said above, it will be seen that the final result of the third process of decomposition of woody fibre, in which the air being excluded, the oxygen is shared between the carbon and hydrogen, would be $C_{20}H_3$. A similar result would be obtained, with the simultaneous evolution of marsh gas, if we suppose 6 CO_2 + 8 HO + 3 CH_2 to be removed from an equivalent of woody fibre, leaving $C_{15}H_6$=$C_{20}H_8$—$C_{24}H_{9\cdot5}$, which approaches the composition of most bituminous coals and of idrialine. A farther elimination of marsh gas, would leave a residue of pure carbon, and thus, as Bischof has suggested, vegetable matters may be converted into anthracite without the intervention of a high temperature.

The elimination of the whole of the oxygen in the form of carbonic acid, would leave a compound with a large excess of hydrogen, of which it would be necessary to remove a portion in the form of water or marsh gas in order to reduce the residue to the composition of petroleum. We know of no combination of carbon and hydrogen in which the number of atoms of hydrogen surpasses by more than two, those of hydrogen, the general formula being $CnHn+2$, so that oils like $C_{16}H_{20}$ and $C_{26}H_{28}$ contain nearly the maximum quantity of hydrogen, and a body like $C_{14}H_{20}$, whose formation we have supposed above, could not exist, but must break up into marsh gas and some less hydrogenous oil like petroleum.

We do not know the precise conditions which in certain strata favor the production of petroleum rather than of lignite or coal, but in the fermentation of sugar, to which we may compare the transformations of woody fibres, we find that under different conditions it may yield either alcohol and carbonic acid, or butyric and carbonic acids with hydrogen, and even in certain modified fermentations the acetic, lactic, and propionic acids, and the higher alcohols, like $C_{10}H_{12}O_2$. These analogies furnish suggestions which may lead to a satisfactory explanation of the peculiar transformation by which, in certain sedimentary strata, organic matters have been converted into bitumen.

* By Dr. T. Sterry Hunt, in a paper communicated to the "Canadian Naturalist and Geologist."

CARRIAGE LAMPS.—A correspondent of the *Times* makes some sensible remarks on lamps in carriages, which are worthy of being pondered by those in authority. The reference to "our not over-well lighted streets," will recall the fact—unpleasant, though true—that New York is one of the worst, if not the *very* worst lighted cities in America. The miserable little three feet burners which give forth the only luminous rays furnished by the authorities, afford a striking contrast with the larger and better burners abopted for street lamps in other cities. The prevailing dimness in the streets at night is a strong argument in favor of the views of the correspondent in question, who says:

"There is, I believe, an ordinance requiring hackmen to keep their carriage lamps lighted at night in order to better exhibit their numbers to customers, etc., a provision generally adhered to, though in certain cases a more rigid enforcement might be advantageous.

But there is no reason why the rule should not be applied also to private carriages, livery coaches, etc., which go dashing about our not over-well lighted streets at night, with perfect impunity, and oftentimes, from their rapid rate, more especially in turning corners, with great risk to pedestrians at crossings, etc.

More especially is the danger aggravated at the present time by the slush and ice in the streets over which the vehicles roll almost noiselessly; to say nothing of persons being a little hard of hearing, whom the sight of the moving lamp in the distance would sufficiently warn.

"The provision might reasonably apply to all vehicles, but *carriages* are particularly obnoxious at night, and people who can afford to go to operas and parties in their own or hired carriages, can also afford this slight safeguard to their less fortunate fellow-citizens. In London and Paris these things are managed better. Let it be done here."

RAILWAY CARRIAGE LAMP.—As an improvement upon the lamp at present used in railway carriages, and in which the supply of oil to the wick is regulated by a bird-fountain, Mr. Alexander Allan, in a paper read before the Institute of Engineers, in Scotland, proposes the dip-pipe-fountain lamp, which he states will maintain the oil in the burner dish, at a constant and invariable level, thus insuring the uniform saturation of the wick, and a steady flame under all circumstances. Mr. Allan uses in connection with the lamp fountain a tube, which is inserted through the filling screw, and descends down the fountain and oil tube, to the level at which it is desired to maintain the oil in the burner dish. Whenever the surface of the oil in the dish falls below the level of the lower end of the dip-pipe, the surface also falls below the bottom of the dip-pipe, and a bubble of air passes from the latter, and rises to the surface of the oil in the fountain, liberating exactly as much as and no more than will restore the true level in the dish, and this action will continue so long as there is waste by burning, and until the oil is exhausted. In the course of the discussion, in which Messrs. Neil Robson, D. More, and J. Brownlee, took part, the lamp was highly spoken of, and it was stated that one railway company, after severely testing the lamp, had applied for a license to make it.

PHILADELPHIA STREET LAMPS.—There are in the various districts of Philadelphia, under charge of the Department of Public Lighting, six thousand six hundred and seventeen lamps, of which three hundred and twenty-three burn fluid, and the remainder gas.

WATER WORKS OF AMERICA.

SAN FRANCISCO, CALIFORNIA.

SPRING VALLEY WATER-WORKS.

The charter under which this company is organized, was granted by the Legislature of 1858, approved April 23d, entitled "An Act to authorize Geo. H. Ensign, and others, owners of Spring Valley Water-works, to lay down water-pipes in the public streets of the city and county of San Francisco."

The company was organized in July, 1858, by Geo. H. Ensign, Edward Jones, and Henry Baker, with a capital stock of $60,000, which was increased in 1860 to $3,000,000.

It commenced successful operations in September, 1860, the first source of supply, for temporary use, being obtained by the purchase of Islais Creek, five miles distant from the city.

The present distributing reservoir, 84 feet above the level of the bay, is located on Potrero Hill, near Brannan street bridge, with a capacity of 500,000 gallons. From this point water is conducted through iron pipes into the lower portions of the city.

Pipes are at present laid in the following streets:

Brannan, from Centre to Second.
Third, from Townsend to Market.
Fourth, from Folsom to Market.
Second, from Folsom to Market.
First, from Folsom to Market.
Market, from First to Third.
Mission, from First to Fourth.
Minna, from First to Second.
Everett, from Third to Fourth.
Howard, from First to Fourth.
Tehama, from First to Second.
Clementina, from First to Second.
Folsom, from First to Fourth.
Harrison, from Third to Fourth.
Silver, from Second to Fourth.
Bryant, from Second to Third.
North side South Park Alley, from Second to Third.
Kearny, from Market to California.

The company have secured all the available waters on the peninsula, as far south as Santa Cruz county, embracing the Pillarcitos Creek, the San Mateo, the Junitos, the Lobitos, with the San Gregorio river and its branches, containing in all some 35,000,000 gallons of pure mountain water per day in the dryest season of the year. These streams flowed into the ocean at and near Half Moon Bay.

The engineer found it necessary to construct a tunnel 1,600 feet long through the coast range of mountains, near Crystal Springs Farm, which has been completed. Also three other tunnels have been cut on the route or line of the works—of 200 feet, 400 feet, and 800 feet in length. The one through the coast range being at an altitude of 700 feet above the level of the sea.

The aqueduct to convey the waters of the San Mateo and Pillarcitos Creeks has already been built 13 miles in length—leaving about 17 miles yet to be completed, the whole distance being nearly graded to Laguna Honda.

The introduction of these waters into Lake Honda, will be done as early as May next. This lake, distant three miles from Hayes' Valley (at an altitude of 366 feet above the level of the sea, and 63 feet above the top of Telegraph Hill,) has already been drained, and is now being cleaned out and repaired as the great distributing reservoir of the company. Its present capacity is 100,000,000 gallons, capable of being increased to any extent, as the wants of the city require. From Lake Honda, the waters are to be conducted through 20 and 16-inch mains, by way of Market street, into the city.

The drainage of Lake Honda was one of the most successful engineering operations ever conducted in California, and, coupled with the tunnel through the coast range, which was driven simultaneously from both ends, forms the greatest of such works in the State, if not in the Union.

The amount of pipe already received is 20 miles, most of which are laid down south of Market street, together with ten additional miles on the way from Scotland and Pennsylvania. The company propose to lay down 50 miles of mains and service-pipe without delay.

The officers of the company are as follows: *President*, Wm. N. Tillinghast; *Secretary*, Ed. Mickle; *Engineer*, A. W. Von Schmidt; *Banker*, Abel Guy; *Trustees*, Henry Carlton, Jr., W. B. Johnston, Wm. N. Tillinghast, A. W. Von Schmidt, and Robert Roxby.

SAN FRANCISCO CITY WATER-WORKS.

After the failure of the Mountain Lake Water Company to carry out their plans of introducing fresh water into this city, Messrs. John Bensley, A. Chabot, and A. W. Von Schmidt, in 1856 applied to the Board of Aldermen for a charter to supply the city from Lobos Creek, which that body refused to grant. After several mishaps and discouragements to the enterprise, the Board of Supervisors, August 6th, 1857, granted the required privileges, but legal troubles ensued, and it was not until the winter of 1858 that they were enabled to start the work of building flumes, tunnels, etc. The fresh water was delivered to consumers on the 1st September, 1858, so the company is now entering the fourth year of its usefulness. A reservoir was then constructed on Greenwich street, above Sansome, on Telegraph Hill, with a capacity of eighty-seven thousand gallons. A larger reservoir was subsequently constructed near Black Point, occupying six fifty vara lots, between Chesnut, Hyde, Larkin, and Bay streets, one hundred and forty feet above the base of the city grade, which is supplied by a steam-pump, located beneath the bluff on Beach, near Polk street, adjoining the Pioneer Woolen Factory, the water being conveyed from Lobos Creek in wooden sluices. The capital stock of the company is fixed at $1,500,000, but from the account up to the present month, as obtained at the office, the cost of the works has been $913,332 44. The company claim to have laid about twenty-five miles of pipe, eighteen, sixteen, and twelve inch, and have some five and a half miles ordered—some on the way—which it is their intention to lay as soon as it arrives.

The reservoirs during the past year have been bricked and cemented throughout, and the embankments raised, so that the impurities with which the waters used to be affected, are now remedied.

The amount of water supplied for family and manufacturing purposes, daily amounts to an average of 500,000 gallons. Connected with the mains are 140 fire hydrants, 60 of which have been placed within the past year.

There is now in course of construction a tunnel from the pumping works at Beach street, through the hill to the reservoir, which will be about 3,000 feet in length.

The company centemplate soon commencing another tunnel through the hill at the west of the Presidio Barracks, which, when completed, will enable them to bring the water through a 30-inch cast iron main from Point Lobos on nearly a straight line, thus doing away with the use of the wooden flume around the beach.

The laying down of another 18-inch pipe, from the lower reservoir, is contemplated next spring, if necessary, for fire uses in the upper portion of the city.

The present officers of the company are as follows: A. Chabot, *President*; P. Carter, *Secretary*; A. Chabot, H. S. Dexter, C. H. Simpkins, and R. G. Sneath, *Trustees*; C. W. Boynton, *Engineer*; and W. B. Swan, *Register*.

SAFETY OF GAS ILLUMINATION.

On page 56 of this volume, we took occasion to criticize the absurd opinions of the late Mr. Braidwood, superintendent of the London Fire Brigade, respecting the alleged danger of using gas-lights in the British Museum. The successor of that gentleman seems to be tinctured with the same erroneous opinions, which call forth the following sensible remarks, which we take from the *Journal of Gas-Lighting*.

Captain Shaw, the superintendent of the London Fire Brigade, appears to have inherited from his predecessor, the late Mr. Braidwood, all his prejudices against gas, and to be equally ignorant with that gentleman of the phenomena of its combustion. In his annual report of the fires that have occurred in the metropolis during the past year, he attributes the cause of nearly 100 out of the 1,183 fires which required the assistance of the brigade, to the direct agency of gas, in one way or another. He lays more stress on this than on any other cause of fire; and the *Times*, following ignorantly in his wake, cautions the public to be extremely careful in the use of this "dangerous light;" and in addition to the fires set down by Captain Shaw to the account of gas, the writer gives "the lion's share" of the "unknown causes" to the same agency. Even the cases of spontaneous combustions may, according to the same authority, be attributed to the drying up of wood-work by the constant use of gas.

These attempts to create a prejudice against gas-lighting, when it has become nearly universal in all the large towns of the kingdom, are as ill founded as they are senseless. No one will deny that gas is dangerous; and that from ignorance, or the want of reasonable precautions, it may be the means of setting a house on fire. There can be no doubt, also, that everybody would be much safer if they would but be content to remain in darkness, and not burn any light whatever. Fires are still more dangerous; and there would be a great saving of risk as well as money, if people would abstain from burning such dangerous materials as coal and wood; for it appears, from Captain Shaw's report, that no fewer than 3,000 chimneys were set on fire in the course of last year. If, however, people will not be satisfied in darkness, or when shivering with cold, they must run some risk, whatever source of light or heat they apply; and the question is, not whether gas is dangerous, but whether it is more dangerous than any other material that could be practically employed for illumination. The fact stated by Captain Shaw that, during the past year, *one hundred and fifty fires were caused "by the incautious use of candles,"* is of itself a satisfactory answer to his objections to the use of gas. It may be confidently asserted, that had the houses in which these fires occurred been lighted throughout with gas, not one-tenth of them would have required the aid of the fire brigade. As to the supposed danger arising from the drying up of wood-work by the heat of gas-flames, we recommend Captain Shaw to light an Argand gas-burner in a small closed room for a few hours, and then observe the effect; and we think that the streams of water running down the window and the walls, would convince him that there is little danger of producing excessive dryness by the burning of gas.

We have a right, when contending for the comparative safety of gas-lighting, to proportion, if we can, the number of accidents caused by its combustion with the quantity of the light obtained, in the same manner as in estimating the comparative safety of railway travelling, the number of persons killed or injured is compared with the number of passengers conveyed; and if that scale of proportion were adopted, the strongest opponents of gas must admit its superlative safety, compared with the production of an equal amount of light by any other means. But setting aside the great advantage of additional light which gas affords, there cannot be any doubt that, for the necessary purposes of illumination, it is much safer than the employment of movable lights. Of course, as the consumption of gas extends, the number of fires caused by negligence, or the improper use of it, will increase also; but the report of Captain Shaw affords evidence that gas is much safer than candles, and even he will not deny that it is cleaner and more economical.

COLOR OF WATER.—A long memoir has been lately published by Wittstein, on the color of water. He establishes—1. That pure water is not colorless, but blue. 2. That the mineral matters which a water may contain, do not affect the color. 3. That the variety of color in water depends more on the organic matter in solution. 4. The organic matter is held in solution by an alkali. 5. The amount of organic matter in solution, depends solely on the amount of alkali. 6. The smaller the amount of organic matter, the less is the color removed from blue: as the organic matter increases, the color goes from blue to green, and eventually to brown. 7. Periodical changes in the color of the same water do not depend on changes in the organic constituents, but on rest and atmospheric appearances. 8. It may be universally accepted as a rule, that the browner a water is, the softer it is; and the nearer the color approaches blue, the harder it is. The difference does not depend so much on the amount of organic ingredient as on the amount of alkali. There is nothing very new in this. Experienced water testers have for some time judged or guessed the amount of organic matter from the color of the water.

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Its purpose is to ascertain and make known all new discoveries in the science and economical application of LIGHT, and promote thereby the interests of companies and consumers; to encourage and aid the introduction of PURE WATER from Lakes and Rivers into Towns and Cities, and to improve the system of SEWERAGE, VENTILATION, HEATING, and DRAINAGE everywhere.

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PROPRIETOR, JOHN B. MURRAY. | EDITOR, C. ELTON BUCK.

SATURDAY, MARCH 15, 1862.

On the first discovery of the flowing oil-wells in Pennsylvania and Ohio, predictions were made that these would soon be exhausted, and that the subterranean reservoir would soon be drained of its contents by reason of the very impetuosity of the oily current issuing from them. Such conclusions as these were very natural; but, like many others claiming the same distinction, they have been falsified, and the revelations of later periods have not only proved the copiousness of the supply, but have added still other sources, and caused the exploration and opening up of new tracts of country of which the oily product is the staple commodity. As a matter of course, those wells from which the oil exudes spontaneously afford a more profitable source of supply than those where pumping is necessary to be resorted to, and the consequence has been that many of the pumped wells have been abandoned, for the reason that their proprietors could not withstand the successful competition run them by the owners of the flowing wells. Prices of the crude oil have sunk to a remarkably low figure, and if the future shall bring with it the new developments which the experience of the past might lead us to expect, there is no means of knowing how much lower the price may fall. Our exchanges from the oil regions are filled with accounts of remarkable discoveries of oil "placers," some of which we occasionally transcribe into our columns.

Of course the distillation of coal for oil has been nearly, if not entirely, discontinued. The natural product of the wells supplies the place of the crude coal oil, and, instead of the latter, petroleums are distilled and rectified for consumption. The consumption of petroleum oils has had a marked effect upon other artificial illuminating agents, and in a great measure has replaced the animal oils, which were formerly adopted. But probably the effect of the petroleum discoveries has been greater upon the candle manufacture than upon any other branch of industry.

The question is often asked, whether crude petroleum will not be made available for the manufacture of illuminating gas, and thus, to a great extent, be substituted for coal for that purpose. Gas consumers regard this question with a hopeful eye, and are not backward in expressing their desires that their bills may be lessened, and that they may share in the general benefits supposed to accrue from the use of petroleum in other forms. Many attempts have been made to use crude rock oils for gas-making, but hitherto the essays for this purpose have not met with that success which it was hoped would characterize them, although some experimenters have claimed to have overcome all difficulties. One of the principal obstacles which seemed insurmountable, is the liability of the gases distilled from petroleum to condense and deposit in drops, not only in the gas-holder and pipes, but even in the chandeliers and fixtures. This would interpose an objection of the most serious nature to the proposed innovation. Some individuals who have been for a long time engaged upon these experiments, assure us that they find no difficulty such as that just suggested, but that by a careful regulation of the temperature in distilling the oils, they have succeeded in producing a gas of high illuminating power—equal to the best cannel gas—and of as permanent a quality as could be desired. This is a question of practice alone, and practical trials only can determine whether coal will be replaced by petroleum. In the event of such a change, important modifications of distillatory apparatus would undoubtedly follow, the whole science of gas-making subjected to a general revision.

A correspondent of the *Herald* draws attention to the danger of using lead water-pipes, and presents some views which, though not new, still may be worth while to consider. The poisonous action of salts of lead when introduced into the system, and the deleterious effects produced upon workmen in metallic lead works, painters, &c., give emphatic admonitions of the care which should be exercised in using this metal in any form. It cannot be questioned that the water supplied through lead conduit pipes is often contaminated with it, and persons frequently suffer incipient forms of lead poisoning without dreaming of the malady which affects them. It would be a boon to the public if some other material having the advantages of lead without its disadvantages, could be adapted for the purpose of water-pipes. The cheapness of this material, the ease with which it may be laid and connections made, its flexibility and strength, all present strong claims of usefulness; almost the sole drawback—and this a very serious one—being its liability to become acted on by water, and thus introduce disease. A field is open for inventors in this connection which may repay studious application.

It is stated that the insurance companies of this city have declared the use of carbonizing apparatus to be dangerous, and affix an increased rate of premium in all premises where they are used. In this respect the companies are emulating the example set by the London companies when Mr. LOWE first introduced the process of extra carburation to the public. In view of the fact that burning fluids and explosive coal oils are permitted to be used with impunity, it seems like little else than a broad farce to taboo the employment of a limited quantity of naphtha, or some kindred substance, for the purpose of rendering gas more luminous. But if it be admitted that the carbonizing apparatus is dangerous within doors, surely no such arguments can be urged against its use on street lamps; and if the Corporation of the city of New York is too penurious to burn a liberal amount of gas for the benefit of the people, by all means let us have carbonizers attached to the public lights, so that some faint glimmering of luminosity can be visible after the shop windows are closed. The streets of the metropolis are wretchedly lighted. The miserable little 3-feet burners maintain a very unequal contest with the surrounding darkness, and lead to the unjust conclusion that the gas-light companies of this city make an article of very inferior quality. Strangers from other and better lighted cities are struck with the dim and gloomy appearance of our streets after nightfall, and seldom assigning the true reason—viz., small burners—their conclusions almost invariably are, that gas of a very poor illuminating power is produced. The question of adopting carbonizers on the public lamps in London is now being mooted in that city, and reports favoring the proposed innovation having been made by well-known chemists, the probability is that the measure will be publicly tested. In view of the benefits to be derived from this proceeding, it would be well to have it fairly tried here; for the comfort of the citizens generally would be greatly subserved by any improvement, and they would gladly hail an innovation promising such a desideratum as carbonized gas has proved to be in London.

PROPOSED TAX ON GAS.

The Committee of Ways and Means have recommended a tax of twenty-five cents per thousand feet on gas, as a source of revenue from that branch of industry, and expect to realize $1,000,000 from that source.

That gas should be taxed as well as other luxuries we decidedly think, but are of opinion that the rate named is too high to attain the object proposed. The various city companies, whose sales are large, whose profits enable them to divide regularly ten per cent. per annum, and lay up a surplus sum for quiet distribution in the shape of extra dividends, and whose stock ranges from ten to twenty-five per cent. premium, can well afford, and should be made, to pay liberally. But the larger number of country companies whose business is limited, and whose dividends of six to seven per cent. are eked out with the greatest difficulty, are really not able to stand this burthen. To the majority of companies, therefore, ten cents per thousand feet would be a high tax, and quite as much as they could bear. At this rate, many companies which, under a higher tax, would be compelled to succumb and shut up, could live, and a handsome revenue be secured to the government.

But we do not see why a discriminating duty cannot be laid on gas companies, so apportioned as to fall heaviest where the greatest strength exists to bear it. Thus, the sales of the companies and their net receipts proportioned to their capitals, would establish equitable data upon which to tax them.

The gas companies of *Albany*, N. Y., *Baltimore*, Md., *Boston*, Mass., *Brooklyn*, N. Y., *Buffalo*, N. Y., *Chicago*, Ill., *Harlem*, N. Y., *Jersey City*, N. J., *New Haven*, Ct., *New York*, N. Y., *Philadelphia*, Pa., *St. Louis*. Mo., and *Williamsburgh*, N. Y., and the like, are now, and have been for many years, reaping rich harvests. Their shares range from 120 to 225 per cent. upon par value, and they ought to bear the brunt of a burthen which, if laid upon the weaker companies, will shut out from the blessing of light whole communities that really cannot afford to meet this emergency.

We beg to suggest this consideration to the Committee of Ways and Means, who have done us the honor to consult the AMERICAN GAS-LIGHT JOURNAL in forming the basis of their action; and we earnestly caution them to consider the subject as we have suggested, lest a hasty legislation may inflict an injury rather than meet the case in point.

CODE, HOPPER & GRATZ'S METERS.—The gas-meters from these well known manufacturers, are becoming the meters *par excellence* of America. Besides their very extended national connection in all parts of the country, there are many persons in this city who prefer their meters, and they are, consequently, being introduced here. This house deserves all its success for their liberality, energy, and high-toned business intercourse.

BALTIMORE, MD.—We regret to announce that our esteemed friend, Prof. W. E. A. Aikin, no longer holds the position of gas inspector in Baltimore, the present mayor of that city having removed every officer appointed by the former incumbent. Prof. Aikin's long experience in gas chemistry, and his high qualifications as a scientific man, eminently fitted him for the position he held. We have not heard who has been selected to fill this important office.

ANSWERS TO CORRESPONDENTS.

L. C. F., of N. Y.—*Your query will receive early attention. We will have to consult the official papers before venturing an opinion. We think, however, that you are right.*

O. P. Q., of Mass.—*Cyanogen or its compounds are not likely to be found in coal gas, as they are readily absorbed by the lime in the purifying house. By a chemical examination of the waste lime, these may be detected.*

J. S., of Ills.—*The lime light, the calcium light, and the oxyhydrogen light are identical with the Drummond light, as it was called after Lieut. Drummond, who introduced it.*

W. E. D., of Ky.—*Several parties are now engaged in experimenting upon the subject in this city. It will probably take some months to fully decide the matter. If it can be done, great results will follow.*

R. B. P., of Pa.—*We cannot accept your offer, as it is contrary to our established rules.*

L. P., of Pa.—*If you had carefully perused our pages you would not need to ask the question. You will find a full exposition of it in either Hughes or Clegg. The former work will probably suit you better than the other, on the score of economy if for no other reason.*

F. E. C., of N. J.—*No mere written description of a lighthouse lamp, with its revolving apparatus, arrangement of lenses, &c., could give you even a faint idea of the subject. Ronalds & Richardson's Technology contains several well executed illustrations, which will give you a fair insight into the mechanism of the lanterns.*

H. J. D., of Ohio.—*Your idea, though a good one, is not novel, and therefore not patentable, unless the apparatus be constructed in a manner essentially different from any preceding pattern. Mr. Goddard, of Ipswich, England, some years ago contrived a portable gas fireplace, which is highly popular, and which answers almost exactly to the description of the apparatus you have made. The burner of Goddard was estimated to burn about 7 feet of gas per hour, and heated a room about 20 feet square. Another advantage possessed by it was, that the products of combustion were conveyed away, and not allowed to escape into the room, as is the case with almost every other gas stove. When gas is sold in this country at half its present price, it may be economical to use it for warming rooms, but until then other fuel will be cheaper.*

S. P. M., of Md.—*Benzole and benzine are identical. The former designation is generally adopted by scientific writers. Nitro benzole is sold by the apothecaries, under the name of oil of myhrbane. It resembles the oil of bitter almonds in odor and taste very closely, and indeed is often substituted for it in perfumery and confectionery.*

E. W. S., of N. H.—*The Worthington water-meters are pronounced to be very reliable and have given satisfaction wherever used. See the abstract of the Jersey City Water-Works report, published on page 148 of this volume.*

CORRESPONDENCE.

COAL TAR AS FUEL.

GAS OFFICE, HALIFAX, NOVA SCOTIA, 7th February, 1862.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

In your Journal of the 15th ultimo, I observe in answer to your correspondent C. E., of N. Y., regarding the use of coal tar as fuel for heating retorts, you state that a number of contrivances have been used to burn tar under the retorts, but that they have never proved successful, and advising him to drop the subject as it will be merely a waste of time and talent to prosecute his experiments further.

I have no hesitation in saying, that oftentimes during the last fifteen years, I have been of your opinion; for I confess to having spent a very great deal of time, (I wont say talent,) trying to accomplish the same object, but being persuaded that it *was possible*, I could never consent *to give it up* as a hopeless task, and therefore I went on the principle of try, try, try again. And I am happy to say, that I am now amply rewarded for all my time and trouble in the satisfaction I have had during the last two years of seeing two benches of three retorts each, heated from *coal tar alone*, and that, too, with far less trouble to the firemen than those that are heated by coal. The heat is very regular, and can be increased to any extent without the least trouble. I find, however, that with a consumption of from 45 to 50 gallons of tar to each furnace, every twenty-four hours, I can keep up a heat sufficient to burn off a charge of coal of 1¼ cwt. every 4 hours.

I am not at all aware what your correspondent's scheme is, but I am pretty certain it cannot be the same as mine, and if it is a matter of much consideration for him to use his coal tar for fuel, in the quantities I have mentioned, he will find by communicating with me, that I can show him a plan for heating retorts with *coal tar alone*, that has given me great satisfaction for the last two years, and which I have no doubt would do the same with him, and which I now find effects a much larger saving than I at first counted on.

I am your obedient servant,

GEORGE BUIST, *Manager.*

REPORTS OF GAS INSPECTORS.

BALTIMORE, MD.

For the week ending February 27, 1862.

Illuminating power, in Candles.	Sulphur, grs. in 100 cubic feet.	Ammoniacal Gas.	Sulphuretted Hydrogen Gas.	Carbonic Acid Gas.	Pressure in Main. Maximum.	Pressure in Main. Minimum.	Burning pressure during trial of Gas.	Maximum Illuminating power.	Minimum Illuminating power.	Bromine condensation per cent.
16.	less than 5 grains.	in great excess	none	none	3 7/10	1 6/10	2 1/10	17.5	15.4	5.5

WILLIAM E. A. AIKIN,
Inspector of Illuminating Gas.

EFFECTS OF COAL-GAS UPON ANIMALS.

Dr. C. B. Aldis recently read before the Royal Medical and Chirurgical Society of London, England, a paper on the effects of coal-gas upon the animal system. Dr. Aldis was induced to investigate the qestion in consequence of the examination of gas, as to its purity, now forming an important branch of the public health. He also wished to ascertain whether cannel coal-gas destroyed life sooner than common gas.

A rat was first killed, in order to compare the internal organs with those of others destroyed by the gases. The eyelids were closed; the lungs collapsed, and of a whitish color; both ventricles of the heart contained black coagulated blood.

Six experiments were then made—two with cannel coal-gas, three with common, and one with foul gas. The rats were placed under a glass vessel, into which the gases were passed. They soon began to gasp, and became insensible; and, after lying motionless for a few seconds, convulsive movements occurred, upon which death ensued.

The eyes were open, and projected; the outer surface of the skull was exceedingly red in all that were examined, and dark fluid blood escaped from them, when the head was opened; the vessels on the surface of the brain were pinkish, and some empty; the substance of the brain pale; the lungs collapsed, and of a pinkish color; the heart distended with dark fluid blood; congestion of the abdominal veins.

The eyes of the rat destroyed by foul gas did not project so much, and, on opening the body, a strong smell of sulphuretted hydrogen escaped. The brain and lungs were much congested, and of a brownish color; the heart greatly distended with dark fluid blood—the auricles being nearly black; the abdominal veins gorged with black blood.

The rats compelled to breathe cannel coal-gas died sooner than those exposed to the influence of common gas. Mr. William Bloxam, Jun., had favored the author with the account of a fatal case of poisoning by coal-gas. The man (a gas-fitter) was found dead on the top of a pair of steps, in a closet, in a sitting posture. He should have been doubly cautious in his mode of making the connection of the pipe with the meter, when it is considered that his head was at the upper part of the closet, on a level with the fan light over the door, for, while the gas escaped, this part formed a kind of gas-holder. The deceased, having become insensible, was unable to lower his head beneath the frame of the fan-light; or, had he but struggled and fallen, his life might have been spared.

The paper concluded with an account of further experiments, conducted in the same manner as the foregoing, except that the animals were rendered insensible only—four being afterward exposed to fresh air, another to the action of ammonia and fresh air, and the sixth placed under a glass filled with oxygen. The animals exposed to fresh air recovered more quickly than when other means were adopted. Persons, therefore, who are found rendered insensible by inhaling such gas, should at once be carried to the fresh air as the quickest and best means for their recovery.

PETROLEUM IN GRANITE.—At the Manchester (England) Geological Society, Mr. Binney exhibited a specimen of granite containing petroleum, sent to him by Mr. James Yates, F. R. S., of London. He stated that he had communicated to the society an account of petroleum from peat bogs, so as to show that such substances were now in the process of formation, but he had never before heard of petroleum having been found in granite. Mr. Yates states in his letter to Mr. Binney "that he could find no specimens similar to his either in the museums at the Geological Society or in Jermyn street." Mr. Robert Hunt, F. R. S., was well acquainted with the specimens, and thinks that they are now extremely rare. He has sent Mr. Yates the only record he could find about this substance, stating that about 30 years ago there was discovered in the great copper lode at Carharrack, at the depth of 70 or 80 fathoms, a quantity of bitumen, dispersed throughout the substance of the lode and the contiguous growan. Mr. Yates obtained his specimen in 1818, and it is mentioned in "Aiken's Mineralogy," 1815, p. 60, so that its discovery is of older date than 30 years ago. Copper and tin ores accompany the bitumen. There is no coal in Cornwall, on which account Mr. Hunt thought this bitumen could not be of vegetable origin, but formed by the chemical carbonates or mineral of gaseous matter. All the accounts state that it was found in mineral veins passing through the granite. Mr. Birney said that all bitumens or petroleums, so far as yet known, were formed from organic substance, and no instance was known of any having been formed from brute matter, whether mineral or gaseous. Although the lode in which the bitumen or petroleum was found did occur in granite, it was not necessarily of great antiquity, as the lode might have been formed at a comparatively modern period, and the bitumen introduced at that time.

EXPLOSION OF AN ITALIAN COUNTESS.—The following rather hard story is translated from an Italian paper, and is commended to the notice of scientific men of all denominations for solution:

A death, attended with extraordinary circumstances has just taken place at Cesena Romagna, (Italy,) in the person of a resident of that town, the Countess Cornelia, who had reached the age of sixty-two without any kind of infirmity. One night her attendants observed that, contrary to her usual habits, she appeared rather heavy and sleepy, immediately after supper, but she nevertheless sat up three hours talking with her maid, and then said her prayers and went to bed. The next morning, her maid, alarmed at not being summoned by the Countess, long after the ordinary hour, entered her chamber and called to her. Hearing no answer, and fearing something had happened, she opened the shutters, and was horror struck at seeing the body of her mistress in the state we are about to describe:—Not more than a yard from the bed was a heap of ashes, in which lay two legs, entire from the foot to the knee—and two arms. The head was between the legs. All the rest of the body had been converted into ashes, which, when touched, left a greasy and fetid humidity on the fingers. On the floor, was a small lamp without oil, and on the table stood two candlesticks, the candles of which, had lost all their tallow, but the wicks remained unburnt; the bed was uninjured; the clothes lying as they usually do when a person has risen. All the hangings of the bed were covered with a grayish soot, which had even penetrated into some drawers and soiled the linen they contained. This soot had also found its way into an adjoining kitchen, and covered the walls, furniture, and utensils. The bread in the safe was also covered with it, and when offered to several dogs, they would not touch it. In the chamber over the Countess' room, the lower part of the windows was soiled with a fatty yellow fluid. The whole atmosphere around was impregnated with an indescribable and most disagreeable smell, and the floor of the chamber was coated with a thick, clammy, and extremely adhesive moisture. The Countess had evidently been consumed by an internal fire. Dr. Bianchi, a physician of the town, who has published a pamphlet on the case, thinks that the fire began in the lungs, and was developed during sleep; that the Countess being awakened by the dreadful pain, had no doubt risen to get air, perhaps intending to open the window, but had only been able to leave her bed, when she sank under the fire that was devouring her. The Marquis Scipio Maffei, who had also written on the same subject, says, that the countess was in the habit of rubbing her body with camphorated spirits of wine, which she used frequently, and he thinks that the frequent use of that liquid was one of the causes of her death.

In other words, the Countess, as the boys would say, spontaneously *combusted* and *conflagerated.*

THE WATERFORD, IRELAND, GAS ARBITRATION CASE.

Reprinted from the Clonmel Chronicle of Jan. 22, 1862.

An arbitration in reference to the proper charge to be made by the Waterford Gas Company to the Corporation of that city, for the supply of gas to the public lamps, commenced at the Town Hall, on Tuesday, the 14th inst., and lasted five days. Mr. Wm. Davis, of Clonmel, acted an arbitrator for the company, and Mr. Daniel Cullen, of Limerick, T. C., as arbitrator for the Corporation, and Mr. John Henry Richards, the chairman for the county Waterford, acted as umpire. The Corporation were represented in the arbitration by Mr. John O'Brien (Town Clerk), and Mr. Delahunty, Borough Treasurer, and the company by Mr. David A. Nagle, solicitor, Mr. Anderson, engineer, and Mr. Jones, manager of the works. Evidence was gone into at both sides at great length. Messrs. Anderson, Jones, Nagle, James Beale, Cork; Billows, Queenstown, and O'Hara, Waterford, were examined for the company, and Mr. Trousdall, Limerick, Mr. O'Shea, of Waterford, and several others, on the part of the corporation.

The evidence on oath gone into was of a purely technical nature respecting the expense of manufacturing gas, and the price at which it could be supplied at the lowest remunerative profit, in the course of which many interesting facts with regard to public and private lighting were elicited. The first day Mr. Jones underwent a close examination chiefly in reference to the local gas-works of which he is one of the lessees, the expense incurred in conducting them, the wages paid to the employees, the cost of manufacturing gas, and of conveying it to private and public consumers. The wages paid were shown to be high, and much better than those paid in other towns. The quantity of gas produced by a ton of Newcastle coal was stated to be 9,000 feet, and the coal is now 2s. 6d. per ton dearer than in 1854. The maximum price of gas is 6s. per 1,000 feet, and the average charge made to private consumers, 5s. 8½d., 4s. 9½d. being paid by the largest consumers. The corporation was heretofore only charged £4 per lamp, which the gas company did not think remunerative, and at the renewal of the contract sent in a tender for £4 8s. 6d. This the corporation looked upon as exorbitant, and refused to come to terms though an offer had been made to cheapen the gas to the small consumers. The corporation believed £4 to be a fair price, and were willing to renew the contract at that rate; but the gas company maintained that £5 was no more than a fair price, though they asked only £4 8s. 6d. Mr. Anderson was also examined in reference principally to the relative prices charged for private and public lighting in various cities in England and Ireland. The price of gas in London is 4s. 6d. per 1,000 feet, but that the umpire considered no criterion. In Kilkenny it was stated to be £4 15s. 4d.; in Ennis £4 16s. 4d. per lamp per annum. In Gainsborough the price was 5s. 6d., and in Maidstone 6s. per 1,000 cubic feet of gas. Some evidence was gone into with respect to leakage, in which it was stated that in three years, out of sixty-three million feet of gas there were fourteen millions leakage, that out of public lamps being much more than in private houses. A Mr. Billows, of Cork, swore that £4 17s. 6. per annum was a fair price to be paid for lamps burning four feet of gas per hour. A Mr. Beale, of Cork, corroborated the same statement. Mr. Delahunty said that gas is produced at 3s. 7d. per 1,000 feet, including all costs, and that the company charges at the rate of 6s.; that £1,000 was paid for the management, whereas £300 ought to be sufficient, the difference having to be paid by the citizens of Waterford. The cost of carbonization in Dublin was only 2s. 1½d. per 1,000 feet, while in Waterford it was at the rate of 3s. 6d. Mr. Cullen, of Limerick, the arbitrator for the Corporation, cross-examined the witness with more than legal ability. Mr. Trousdell, the manager of the Limerick Corporation gas-works, was examined. His evidence went to prove the cheap rate at which gas was supplied in Limerick, being at £3 15s. per annum for each lamp. A contract was taken with the Harbor Commissioners to light fifty-one lamps as low as £3 6s. 6d.—no lunar nights—which contract is in force at the present time, and a profit actually realized. He swore the evidence given by Mr. Billows as to £4 17s. 6d., being a fair price for the public lighting, to be far beyond the mark, and at least £1 in excess. On cross-examination it was found that the wages given in Limerick were much lower than those given in Waterford, Mr. Trousdell acknowledging that there was not sufficient pay given to the men for the work done, and appeared doubtful as to what profit, if any, was made on the gas. A great deal of evidence was gone into with regard to the expense of fitting up public and private lights, Mr. Cullen and Mr. Trousdell taking Limerick as the standard, and endeavoring to prove that there was more expense attending the latter than the former; whereas Mr. Anderson showed the reverse to be the fact. Mr. Fisher was examined, and gave it as his opinion, having been connected with the Youghal gas-works for many years as one of the managing directors, that the price charged for public lamps was less than what was paid for the actual gas consumed, and that the private person had to make up for this by the price he was charged for the gas supplied to his house, and thus bore a double tax. To his personal knowledge £4 16s. 6d. per lamp per annum would be a fair price, without allowing anything towards the depreciation fund. Mr. John O'Hara, gas fitter, and Mr. Donaldson, were examined as to the expense attending the erection of a lamp as compared with that of supplying a meter.

The evidence having closed on Friday evening, and the arbitrators having differed in their awards, Mr. Davis's being £4 9s. 8d.. and Mr. Cullen's £4 per lamp per annum, the decision of the case rested entirely with Mr. Richards, the umpire, who adjourned to Saturday morning, and in making his award, spoke to the following effect:

Mr. Richards—As a difference had occurred between the arbitrators, and as the responsibility of deciding on so important a case rested with him solely, he had determined on giving his reasons for his decision. After referring to the company's act, which in the thirty-third section enacted that if the company and the corporation should differ, as to the price to be charged for the gas to the public lamps, the price should be settled by arbitration. He then proceeded to say that the act of parliament, in consideration of the monopoly it conferred on the company, in regard to the breaking up of streets, and laying of mains, had defined the prices beyond which it would not charge private consnmers. Of course those prices would be regulated by the risk of competition, as the private consumer could use another kind of light, and the question would right itself. In regard to the public lighting, as it was a public necessity the Legislature determined that arbitration should be the remedy to protect the corporation from exorbitant prices. The case had been, in his (Mr. Richards') opinion, very ably argued, and from what was proved in evidence, it appeared to him that up to last year the company had charged £4 per lamp, having on the expiration of that contract required the sum of £4 8s. 6d. per lamp, and as the corporation would only give the old price, they called for arbitration pursuant to the statute, and the parties having appointed arbitrators, and not having agreed on an umpire, the magistrates had appointed him as umpire. Viewing the case as one of extreme importance, not only in a financial view, but from the fact that his decision might affect other localities, he had given the case his best attention, and he was glad to be able to state that he felt no hesitation in the opinion he had arrived at. In regard to the public lighting of towns, he had found that the practice principally existing was this—companies who were solely dependent on the support of corporations sought to propitiate the bodies by supplying gas for the public lights of a town at a price far below that charged to private consumers. This habit obliged him to consider whether the public lamps ought to be lighted at a loss to companies. It was too much the habit in Ireland, and especially, he feared, by corporations, to expect more than a fair day's work, for a very inadequate day's wages, and he could not see how the practice he referred to could be supported by any intelligent person. To make the public gas cheap at the expense of the private, was taking money from one man to pay the debt of another—in fact, it was robbing Peter to pay Paul. He considered that in this case the corporation wanted too much, and that the gas company had acted well and liberally. Reference had been made to Limerick, and to the scale of wages paid by the Corporation Gas Company in that city. He found that the wages paid by the company in Waterford, were far more liberal, and he considered that it would be better that the corporation recognized the justice of paying the laboring classes well. With these prefatory remarks, he would observe that all heat and irritation between the contending parties ought now to cease, finally and for ever. To deal with the question at issue, he would turn to a document with which Mr. Jones, one of the managers of the works, had furnished him. It purported to give Mr. Jones's ideas of the price to be charged for a public lamp, lighted from sunset to sunrise. Burning four feet of gas per hour, this lamp would use in that time about 17,308 feet of gas. A charge of 5s. per 1,000 feet was set down as a proper price for the gas; 13s. for lighting, extinguishing, and repairing; 3s. 4d. to repay investment in lamp outfit; and 3s. 10d. for renewal of lamp. These charges would bring out £5 6s. 8d. as Mr. Jones's estimate. Now it was his (the umpire's) business to cut down this charge as low as possible. He would, in the first instance, allow 4s. 6d. per 1,000 for the gas, being about the price charged to the largest private consumer. This would give £3 18s. as the price for the gas. He would disallow the interest on the lamp outfit, considering that it was included in the charge for gas. But he would allow 10s. 6d. for all the other items, such as lighting, cleaning, extinguishing, and repairing, which would bring the charge up to £4 8s. 6d. This charge he considered very moderate, and he would challenge any candid unprejudiced mind to look at the account, which was tendered by Mr. Jones at the outset, and to cut it down below £4 8s. 6d. He (the umpire) could not do so. But as the company knew their own affairs best, and had offered to light the lamps at that sum, he did not feel inclined to increase it, but if they had asked more he would have felt bound to give it, for he could not by any possibility reduce his calculations to the moderate sum they had asked. True, it was Limerick was alluded to as an instance in which the public lamps were lighted at a lower rate. He could not see that the Limerick corporation made gas at a profit, and certainly not for public lighting. Mr. Trousdall, the former manager, the first day of his examination, stated the corporation of Limerick made gas for public lighting at a profit, but on the next day, with a creditable degree of candor, he corrected that statement. On the whole he (the umpire) was satisfied, beyond a reasonable doubt, that he had arrived at a right conclusion. It might be said that in the contract the company had made with their managers, a sum of 3s. 6d. per 1,000 was to pay them for manufacturing the gas. He considered the charge a reasonable one, and he doubted whether if the company made its own gas, they would, if all matters be taken into consideration, make it at a less sum, and in the price he had fixed he only allowed the company a profit of one shilling over what they paid their managers. The award, therefore, he should make would fix the price for public lamps in Waterford at the sum of £4 8s. 6d. per lamp per annum, lighted from sunset to sunrise, and burning four cubic feet per hour.

Mr. Richards having delivered his decision, then retired.

A discussion then arose between the Mayor and the Town Clerk on behalf of the corporation, and Mr. Nagle and Mr. Anderson for the company, in which it was asserted and denied that the award only regulated the price for one year. It was determined to send for the umpire, and the subject in dispute having been mentioned to him on his return,

Mr. Richards stated that he gave his award on the basis of a three years' contract, and from what now had occurred, he had determined to allow the company £4 9s. 8d. for each lamp, if the contract were only for one year. He felt bound to say that had the company asked more than £4 8s. 6d. originally he would have allowed it to them, and he would recommend the corporation to take a contract at that sum for seven instead of three years. They might, it is true, think of making and burning their own gas, but in doing so, he warned them against burning their own fingers. (Laughter.)

The proceedings then terminated, and Mr. Richards left for Dublin.

Referring to the above case of arbitration, the *Journal of Gas Lighting* says:

"We have often exposed the fallacy of the plan of paying less for the public lights than is charged to private consumers, and this view was taken by Mr. Richards, the umpire in the recent arbitration case between the corporation of Waterford and the gas company. He well observed that, 'to make the public gas cheap at the expense of the private, was to take money from one man to serve another—it was, in fact, robbing Peter to pay Paul.' The charge for gas for the street lamps cannot be reduced below a fair remunerating price without injury to the private consumer, who must be charged more to make up the deficiency. There is no reason whatever why the public lamps should be lighted for less than is charged to the largest private consumer, and the practice of making a difference arose from circumstances which should serve as a warning rather than be followed as a precedent. It originated in bribing local authorities, by that means to grant powers to competing companies to open the streets to lay their mains; and the result has in nearly every case been serious loss to the gas companies, whilst the consumers suffer by being charged a higher price for gas to pay dividends on two capitals instead of one."

CHEAP GAS MOVEMENT IN SCOTLAND.

At a meeting held in St. Mungo's Hall, Hutcheson street, Glasgow, on 13th January, 1862, it was

Resolved—"That a Gas Consumers' Society be now formed for the purpose of securing a reduction in the price of gas, from 4s. 7d. to 3s. 4d. per 1,000 cubic feet."

1. Because it has been proved that gas can be afforded in Glasgow at 2s. 9d. per 1,000 cubic feet.

2. Because the small towns of Lanark, Perth, and Kirkcaldy, where the consumption of gas is much smaller, and the cost of manufacture greater, than in Glasgow, the price ranges from 4s. 2d. to 4s. 6d. per 1,000 feet.

3. Because the cost of manufacturing gas in the works of the Commissioners of the town of Greenock is only 3s. 3½d. per 1,000 feet, while a saving of at least 6d. per 1,000 ought, under proper management, to be effected in Glasgow, making the price about 2s. 9d. as above stated.

4. Because gas ought to be supplied as cheaply in Glasgow as in any of the undermentioned places, where the prices are as follows:

Whitehaven.....	2s.	to 2s. 6d.	per 1000 feet.
Plymouth	3s.		"
Bradford....	2s. 4d.	to 3s. 4d.	"
Liverpool.....	3s. 9d.		"
Birmingham..... ..	2s. 10d.	to 3s. 9d.	"
Rochdale....	3s. 3d.	to 4s.	"
Manchester..	3s. 8d.	to 4s.	"
Salford.....	3s. 6d.	to 3s. 10d.	"
Leeds	2s. 10d.	to 3s. 9d.	"
Huddersfield..... ...	2s. 8d.	to 3s. 6d.	"
Sheffield.....	3s.	to 3s. 9d.	"
Blackburn....	3s. 9d.	to 4s.	"
Lanark.....	4s. 6d.		"
Kirkcaldy..... ...	4s.	to 4s. 4½d.	"
Perth.....	4s. 2d.		"

5. Because from the abundant supply of the best and cheapest coals in the kingdom, the cost of the raw material, from which 1,000 feet of gas is obtained, in Glasgow is only about ninepence, thus: A ton of cannel coal costing 10s. to 15s. will yield—

9,000 cubic feet of gas,
12 gallons of tar,
12 gallons of ammonia water,
11 cwt. of coke,

and the value of the above product is 5s. 10d. per ton.

6. Because the rental or income of the two gas companies in 1860, amounted to the enormous sum of £153,385 15s. 6d. While a reduction in the price of gas to 3s. 4d. would not only save the city upwards of £42,000 per annum, but greatly increase its consumption.

It is therefore proposed to take steps to reduce the price of gas by the formation of a new gas company, in one pound shares, with limited liability or otherwise.

The society believe that a new gas company is the only effectual remedy for the public, inasmuch as the Town Council and Magistrates, whose duty it is to protect the ratepayers of Glasgow from unfair exaction, have failed to elect inspectors, in conformity with the late Act of Parliament, to test inaccurate gas meters, while such officers have been appointed in almost every large town in the kingdom; because gas meters now in use often register full 30 per cent. against gas consumers.

As the value of gas depends upon its purity and illuminating power, it is absolutely necessary to secure the appointment of an officer to test and report upon the quality of the gas supplied daily throughout the year, because thin gas will often increase the consumer's bills to a very great extent.

Public attention is called to the above facts, which clearly prove that the city has not been fairly dealt with by the Town Council and Magistrates; because through their neglect the gas consumers have not the power of obtaining either quality, cheapness, or measure. The society have therefore secured the services of George Flintoff, Esq., the eminent gas engineer, who has caused reductions in the price of gas in upwards of 150 cities and towns, with the full determination of ventilating the gas question, and of exposing the meter irregularities, by a series of public lectures in the various wards in the city, so as to secure the return of members to the Town Council who will assist in procuring cheaper and better gas, with honestly-constructed meters.

JOHN COULTHARD, Chairman.
ALEX. GOW, Treasurer.

The committee will sit daily, in St. Mungo's Hall, 59 Hutcheson street, from 2 till 4 in the afternoon, and from 6 till 8 o'clock in the evening, to receive complaints against the gas companies, as evidence of acts of oppression will secure an Act of Parliament should it be necessary.

ST. MUNGO'S HALL, 59 Hutcheson street, Glasgow, February 1, 1862.

COAL-OIL IN CANADA.—About three hundred wells are sunk and in progress at Enniskillin, Canada West, and the monstrous flowing well, which we noticed a few days ago, is said to be capable of yielding oil sufficient to load a four hundred ton vessel daily. This flow has been curtailed by tubing, so that the daily yield now, is only about six or seven hundred barrels, which are being taken care of. Other wells, as good or better, will doubtless be opened in this locality, and the supply of oil will be limitless. These wells are only about fifty miles from this city, not far from the line of the Grand Trunk Railway, and approachable to within fourteen miles by the largest lake boats. The crude material must find a market for manufacture here. Already many Michigan capitalists have invested in claims in the oil region. About $300,000 have been expended in digging wells, erecting refineries, opening roads, &c. There are already half-a-dozen oil refineries in this State, and some of them on a very extensive scale. Others will be erected as the occasion may require, and this branch of manufacture may yet prove the most important in our city or State. The coming spring will doubtless witness great activity both in manufacture and shipment. Letters have been received from England and Scotland, which indicate that the market is to be very great, and the demand will possibly be greater than the supply can fill.—*Detroit Free Press.*

PETROLEUM IN CANADA WEST.

ANOTHER GREAT OIL SPRING.

The somewhat celebrated Mr. Shaw, of Oil Springs village, is not destined to share alone the honor and profits of that remarkable locality. On Tuesday, February the 18th, another person, Mr. Bradley by name, having been boring at a spot situated about 200 yards distant from Mr. Shaw's spring, and having reached to about an equal depth in the rock as he attained, was rewarded for his exertions by an upflow of oil to an extent of 100 gallons per minute. There being no means of saving it, it has overflowed the land, as was the case with Shaw's spring, when it first flew up; and a pitiable waste is going on. Black Creek has become literally a sewer for oil, and its waters are covered over to a depth of fully three inches with the dark green fluid, the wastes from the surrounding wells and springs. The last success of Mr. Bradley was quickly known to the men in the district, each of whom left his well and proceeded to witness the new wonder. They saw in astonishment, and returned to their respective lots, each determined to bore deeper and deeper until the source of the supply should be tapped, and each possess in his own right not an oil well merely, but a veritable oil spring, which should bubble up spontaneously to the surface.

The fact is, the whole district is impregnated with oil. The soil is made visid by it. A piece of earth adheres to your boot, and you become at once odoriferous and offensive. Oil is everywhere. One tastes it in the beer, and even whisky fails to kill it out. The flavor is detected in the bread. You eat bacon, but you taste oil. You smell it and taste it in the air, and hold your nose to lessen its ungracious influence upon the olfactories. You go to bed, but the sheets are oily. You open a door, and your hand which has touched the handle has caught the contagion. You proceed to wash, and find a film of oil upon the water, and as you wipe your face, the skin is imbued by an oleaginous deposit from the towel. Oildom asserts its sway, and Oil is King!

But the means of transporting the immense supply of oil is altogether inadequate to the necessity of the case. Lumbering barrels at $2 each are behind the age, even if they were to be had in sufficient numbers; and it is imperative, therefore, that some new mode of carrying away the precious unctuous flow should be adopted. The plan now proposed is to lay down a five-inch iron pipe to Sarnia, and cause the oil to flow into a common reservoir there, and from thence to be filled into iron tanks, and so conveyed to the seaboard. No vessels or implements once used in this traffic are available for other purposes, as the odor from the oil is so pungent and persistent that it spreads itself into every cranny of a ship in which any large quantity of it may be conveyed. Not long since a few barrels of oil were taken across the Atlantic in a grain vessel, and the result was that the greater portion of the grain was spoiled. It is thought, then, to press into the service, as a kind of retributive justice, the old whale ships, for if the supply of oil continues, the whales will be left to enjoy their monstrous gambols undisturbed by the harpoon. To pass from the pursuit of the whale to be the carriers of ready-made oil would not be difficult, though decidedly unromantic.

If some such plan were adopted, this natural oil will, if the supply continues, become one of the most useful and economical substances known, and will find its way into hundreds of uses. Already such experiments have been made as to convey the conviction that gas of a superior kind can be made from it at 60 cents per 1,000 feet; while, for the ordinary purposes of light, the supply being so plentiful and apparently unlimited, the illuminating fluid now sold must fall in price to such an extent as to make artificial light, to use a vulgar phrase, "as cheap as daylight." From whatever point this subject is viewed, whether as regards the origin of the oil; its supply; the extent of country under which it is found; the uses to which it can be applied; the revolution it is making in the cost of artificial light, in each and all it is most wonderful, and we question if a more interesting sight than that of the Canadian Oil Springs at Wyoming exists in any part of the world.—*London, C. W., Free Press.*

SOUR GRAPES.—The editor of the London *Journal of Gas-Lighting* says: "As for the promises and guarantees of the Federalist Government, they are worth very little now, and will be worth less soon." Wonder whether our respected "Paterfamilias" would decline a few of the 7 3-10ths if tendered him?

COAL-TAR AS A PREVENTIVE OF THE POTATO DISEASE.—M. Lemaire mixed two per cent. of coal tar with earth, scattered the mixture over his ground, dug it in eight inches deep, and then planted his potatoes. None of those protected by tar showed any sign of disease, while more than half of some planted at a short distance on the same day, and left unprotected, were found to be diseased.

PATENTS.

UNITED STATES.

34,359.—R. C. Glyde, of Pittsburgh, Pa., for Improvement in Vessels for Transportation of Carbon and other Oils:

I claim the use, for the transportation of oil in bulk, of boats divided by partitions into separate compartments, substantially in the manner described.

Also the use, for the transportation of oil in bulk, of boats divided into compartments covered over with the deck heads, in the manner substantially as described.

34,373.—Jacob Reese, of Pittsburgh, Pa., for an Improvement in Oil Tanks:

I claim constructing tanks, or other vessels for holding coal and carbon oil or other light oils, with an outer casing around the sides of the oil vessel, so as to leave a space between the casing and the oil receptacle for the purpose of surrounding it with water, substantially in the manner and for the purposes set forth.

Also so constructing the outer casing of oil tanks having double sides, forming a water space around the tank, as that the upper edge of the outer casing shall be higher than the level of the top of the main tank, for the purpose of allowing the oil leaking through the walls of the tank to return itself thereto in the manner described.

34,390.—T. J. Barron, of Brooklyn, N. Y., assignor to Jas. Horner, of New York city, for Improvement in Lamps:

I claim the employment or use in a lamp for burning coal oils or other similar hydrocarbons, of a wick tube, D, constructed of glass or burnt clay, as and for the purpose specified.

I further claim having the tube, D, constructed with a contracted orifice, a, as and for the purpose set forth.

34,398.—J. W. Wheeler (assignor to H. H. Wheeler), of Cleveland, Ohio, for Improvement in Water Elevators:

I claim a wheel or pulley having a V-shaped channel upon its periphery to receive the chain or rope, the inclined sides, A, of said channel being corrugated laterally, and the bottom, C, open, as and for the purpose described.

34,402.—M. L. Callender, of New York city, for Improvement in Hydro-carbon Burners:

I claim, first, The relative arrangement of the cone, d, and the interior deflector, I, with its shield, b, for the purpose of burning hydrocarbon oils, with or without a chimney, in the manner specified.

Second, I claim a burner so constructed as to increase the length of its metallic connection between the flame and the body of the lamp and the wick tube, without adding materially to its height, using for that purpose, the spiral coil, B B', on which the cone, d, is mounted.

Third, I claim the new and cheap method of forming the levers, s s', from the metal of which the body of the burner itself is constructed, by which means the springs to hold the chimney in position and the body of the burner are made simultaneously from one piece of metal.

34,408.—E. T. Covell, of New Bedford, Mass., for Improvement in Lamps:

I claim placing the slitted deflector, d, over the wick tubes, g and f, for the purpose of enabling my said lamp to produce a flat flame from a tubular wick, substantially as represented; but this I only claim when air is permitted to flow through the space within the wick tube, g, for the purpose of aiding in the production of a more perfect combustion than has ever before been produced in an oil lamp.

When a slitted deflector is placed over the tubular wick of a lamp, I also claim supporting the said deflector in such a manner that it can be turned to any desired position, independently of the wick tubes of said lamp, substantially as set forth.

34,411.—G. B. Davis, of Chicago, Ill., for Improvement in Water Filters:

I claim, first, The tub or pail, A, divided into two compartments, C D, by a horizontal partition or false bottom, B, in combination with the filter case, G, perforated at its side or sides, provided with an internal perforated cone, d, and fitted or arranged on the false bottom, B, to operate substantially as and for the purpose set forth.

Second, The combination of the partition or false bottom, B, in tub, A, filter case, G, cocks, E K, and air-tube, J, when all arranged substantially as and for the purpose specified.

Third, The combination of a double-walled tub or pail, A, with the false bottom, B, and filter case, G, arranged as shown to form combined filter and cooler, as set forth.

34,415.—Joseph Dodin, of New York city, for Improvement in Lamps:

I claim the particular shape of the plate of metal combining the mode of locking together at A, and clasping the tube at n, substantially as described.

34,419.—Albert Fuller, of Cincinnati, Ohio, for Improvement in Faucets:

I claim, first, A faucet having an interior elastic tube, by the compression and expansion of which the flow of liquid may be regulated or prevented, substantially as described.

Second, The application of the conoidal tube, D, to the elastic tube, C, for the purpose of securing the latter, substantially as described.

GAS-FIXTURES.

MITCHELL, VANCE & CO.,
MANUFACTURERS OF
CHANDELIERS,
And every description of
GAS-FIXTURES,
WAREHOUSE, No. 620 BROADWAY.
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(Late Starr, Fellows & Co.)
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GAS-FIXTURES
AND CHANDELIERS,
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HALL LANTERNS, &c.,
No. 74 Beekman Street, New York.
Manufactory, 71, 73, 75, 77, 79, 81, 83 Boerum st.
And 88, 90, 92, 94, 96, 98 and 100 Johnston st.,
Brooklyn, N. Y.

GEORGE H. KITCHEN & CO.,
Manufacturers of
Fixtures for Gas-Light Purposes,
Wood's Building, No. 561 Broadway, New York.
Office of the Inspector of Gas Meters for the State of New York.

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to which they would respectfully call the attention of the public.
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PENDANTS, &c., in Bronze and Gilt.
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C. A. VAN KIRK & CO.,
MANUFACTURERS OF
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Ambrose's Patent Coal-Oil Burners, to be used without Chimnies; Patent Paragon Coal-Oil Burners; Patent Improved Excelsior Coal-Oil Burners, Hand Lamps, Columns, &c.
MANUFACTORY AT FRANKFORT, PHILADELPHIA.
SALES-ROOM, 626 CHESNUT ST.
☞ Every article warranted equal in design and workmanship to any manufactured in the country.

PHILADELPHIA GAS FIXTURE Works.—Warner, Miskey & Merrill, Manufacturers, Store, No. 718 Chestnut street, Philadelphia. Warner, Peck & Co., No. 376 Broadway, New York, would respectfully inform he public that they continue to Manufacture all kinds of Gas Fixtures, Lamps, Girandoles, Bronzes &c., and that their large and varied stock comprises the simplest as well as the most elaborate patterns, designed by their French artists. They also continue to keep at their store, 376 Broadway, a large and full assortment of all their manufactured Goods. Dealers and others are invited o call and examine.

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STRATTON & BROTHER'S PATENT GAS-WORKS, for making Gas from ROSIN or COAL OILS. STRATTON'S Patent Double Retort, for Coal, Wood, or Rosin.
Our Patent Gas Works have been put up in some forty Country Residences, Factories, Churches, &c., in which an experience of *ten years* gives entire satisfaction.
Water Works also put up in country residences.
All work warranted.
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STRATTON & BROTHER,
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BUTLER'S PATENT PORTABLE
ROSIN GAS-WORKS,
FOR
Dwellings, Churches, Country Villages,
As well as for Consumers in Large Cities.
JOHN BUTLER,
No. 112 Fulton st. and 15 Henry st.,
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FOR LIGHTING RAILROAD CARS AND STEAMBOATS
☞ WITH GAS.
The whole process of Filling the Gas-Holders of a Railway Train, requires but Three Minutes.
Apply to the
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C. R. WOODWORTH, Manufacturer of
PORTABLE GAS WORKS,
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DRAIN PIPES, ENGLISH AND AMERICAN.
Garnkirk Chimney Tops,
Plumbers' Materials,
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For Sale by
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GASOMETER RIVETS.

PHILLIPS & ALLEN, Pennsylvania Avenue, above 22d street, Philadelphia.—GASOMETER RIVETS of all kinds.

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ROBERT McMURRAY & CO., No. 29 Fulton Street, New York, Manufacturers of Copper, Brass, and Iron Wire Cloth for Gas Works, all kinds of Foundry Riddles, Sieves, and Screens. Improved Wire Window Shades, Wire Bolting Cloth, Duster-Wire, Wire Cloth for fanning machines, Rosin, &c., Locomotive Wire, Fire Guards, Ornamental Wire Work of every description. Patent Improved Wove and Laid made Dandy Rolls repaired and designed to order.

HOT WATER GAS STOVES, Manufactured by HUNTER, KELLER & Co., 144 Centre street, New York.
See Engravings on page 163, Vol. II. of this JOURNAL.

GLENDON COAL-OIL COMPANY of Boston, Massachusetts, incorporated June 1, 1859.
E. F. JONES & CO., Agents,
3 Kilby st., cor. Central, Boston, Mass.

GAS-COAL.

LIVERPOOL AND NEWCASTLE
CANNEL & COAL,
FOR
Gas-Manufacturers and House Use.
The careful shipment of the best qualities, of Cannel and Coal, at the lowest rates current at the time of engagement guaranteed.
T. W. PARMELE, Agt.,
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"PEASLEY CROSS" SUPERIOR HOUSE CANNEL.—The undersigned is receiving regular supplies of the above well-known and choice Cannel, selected carefully, for sale, ex ship or from store, in lots to suit purchasers, on reasonable terms.
Dealers can be supplied by lighters, at their yards, from ships Vanguard and New World, now discharging, and from other vessels to arrive.
Apply to RICHARD THACKRAY,
No. 44 Exchange Place.

F. BUTTS & CO. (Successors to BUTTS & KENDALL),
DEALERS IN THE CELEBATED
Sterling Coal
Pittsburgh and other Gas Coals,
P. O. DRAWER, 74,
CLEVELAND, OHIO.

GAS-METER FLUID.

FLUID FOR GAS-METERS.—The undersigned is prepared to furnish the Glycerine Meter Fluid in quantities to suit purchasers. *It does not evaporate, can be made to stand any degree of cold liable to occur in this country or in Canada, and does not corrode the metals of the meter. It has been in use successfully for the last three years.*
For particulars, references, &c., address the manufacturer, HENRY BOWER,
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DANIEL THOMPSON, Machinist and Manufacturer of Stop-Cocks, Fire-Plugs, &c., for Water-Works, Stop-Cocks, Valves, Drip Pumps, &c. for Gas-Works, No. 133 Elfreth Alley, Philadelphia.

GAS THERMOMETERS FOR ascertaining and regulating the temperature of the gas while passing through the purifiers into the station meters. For sale at the Rooms of the AMERICAN GAS-LIGHT JOURNAL.

NEWSPAPER WRAPPERS. Mara's Patent Self Sealing and Folding Water-lined Newspaper Wrappers, $1.50 per 1000. Sold by all Booksellers and News Agents throughout the United States and Canada.
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148 South Fourth Street,
Philadelphia, Pa.
☞ Any newspaper that will give the above advertisement one or more insertions, and send to the publisher a marked copy, will receive the book by return mail, post paid.

GAS & WATER-METERS.

H. R. WORTHINGTON'S PATENT Water-Meter.—This Meter combines accuracy, simplicity and remarkable durability, with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.
HENRY R. WORTHINGTON,
61 Beekman street, N. Y.

JOSEPH LENNIG & CO., Nos. 313 & 315 New Market St., above Vine St., Philadelphia, Pa., Manufacturers of Wet and Dry Patent Gas-Meters, Station, Show, Customer, and Experimental Meters, Photometers; Pressure-Registers, Indicators, and Gauges; Governors, Meter-Provers, Centre-Seals, Fluid Gauges, &c. The flattering Testimonials we are receiving from Gas Officers, accompanied with expressions of such general satisfaction, and the fact of a tried experience for fourteen years, must present itself as a security to parties desirous of securing the most reliable Instruments. We therefore recommend our Patent Dry Gas-Meter, believing it superior to any Meter manufactured. Messrs. J. LENNIG & Co. confine their sole attention to the business of GAS-METER making. Our materials are the best in use; the strictest attention is given to workmanship, and we guarantee entire satisfaction to all purchasers. Purchasers may at any time inspect our Works, and the materials of which our Meters are manufactured. We are fully prepared to execute all orders, upon the shortest notice, and it will be to the interest of parties to call upon us. Each meter tested separately by a sworn Inspector, and sealed when desired. Meters repaired and forwarded with dispatch.

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FREEZING OF GAS-PIPES.—Walton's Patent Anti-Freezing Apparatus illustrated by Engravings in the AMERICAN GAS-LIGHT JOURNAL, of Jan. 1, 1861, page 212, is the most simple, durable and efficient of any known process.
See also certificates from Cincinnati, O., and Louisville, Ky. Gas-Works in same number, page
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HEATING APPARATUS.

JOSEPH NASON & CO., Constructors of Apparatus for Warming Public and Private Buildings by Steam and Hot Water.
Improved Fans for Ventilating Hospitals and other Public Buildings.
JOSEPH NASON,
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WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies. For Sale at greatly Reduced Prices.
Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.
Patent GATES, for Water and Steam-stops.
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ANALYTICAL CHEMIST.

CELTON BUCK, ANALYTICAL and Consulting Chemist, 39 Nassau st., New York. Analyses of Ores, Minerals, Soils, Guanos, Coals, &c., and Tests of Commercial Articles, carefully and promptly made. Consultations may be had, and opinions given on Chemical questions. Samples for analysis from a distance, may be sent by mail or express, directed to the Laboratory as above.

THE

STERLING GAS-REGULATOR,

Improves the Light and Saves a Large Per Centage of Gas.

MANUFACTURED BY THE

WHEELER & WILSON SEWING MACHINE COMPANY.

It is well known that Printers require the best and most brilliant light. In proof of the superiority of these Machines over all others, the following New York establishments are using them, and testify to their excellence:—New York Times, New York Herald, New York World, New York Tribune, New York Sun, Journal of Commerce, Courier & Enquirer, Evening Post, The Zietung, Dispatch, Leader, Scientific American, Advertiser and Spectator, Independent, Daily News, Harper's Monthly and Weekly, Transcript, Mercury, Atlas, Life Illustrated, Albion, Spirit of the Times, AMERICAN GAS-LIGHT JOURNAL, Christian Enquirer, Churchman, Church Journal, Christian Advocate, Christian Ambassador, Christian Intelligencer, Observer, Sunday Times, Sunday Courier.

By order of the New York and Brooklyn Common Councils, these Regulators are now used in the City Halls, Police Stations, Markets, and other Public Buildings in both cities.

They are Warranted by the

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To keep in order, and always maintain the pressurs of the Gas at the lowest point for a brilliant light and economical combustion. They are so constructed that *under no circumstances can the Mercury get into the Meters, or in any way injure them.*

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For Protecting the Flues and Preventing Steam-Boiler Explosions.

This is a reliable High and Low Water Detector, arranged so as to render it one of the best Water Gauges ever attached to a Steam-Boiler; always presenting before the Engineer at sight the exact height of the water, and if, by oversight or by sudden leakage, the water gets low in the boiler, it will cause an alarm before the water gets below the flues, thereby preventing an explosion. This Gauge can be made to alarm at any point desired as a High Water Detector, thereby preventing the water from getting to that height as to be forced into the cylinder of the engine, often causing serious accidents. Thus it is a High as well as a Low water Detector. For sale by

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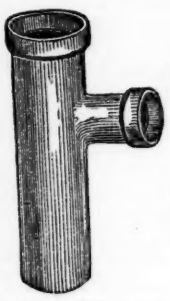
153 Centre st., corner of Canal st., New York,

Where a Gauge is constantly in operation.



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PURE WATER & SOIL PIPE,

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Wortley Fire-Brick Works, Leeds, England.

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PATENT TUBE MAKERS,

THE OLD TUBE WORKS, WEDNESBURY, AND THE ALMA WORKS, WALSAL, STAFFORDSHIRE,

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The original Manufacturers of WROUGHT-IRON GAS TUBES, and the Inventors of the Lap-welded Tubes for Locomotive and Marine Boilers. All kinds of TUBES and FITTINGS, whether for Gas, Steam, or Water. Galvanized and Composition Tubes. Chandeliers, and every kind of Brass work for Gas and Steam.

STOCKS, DIES, AND TAPS OF ALL SIZES. CAST-IRON PIPE AND GAS-METERS.

All Goods Warranted.

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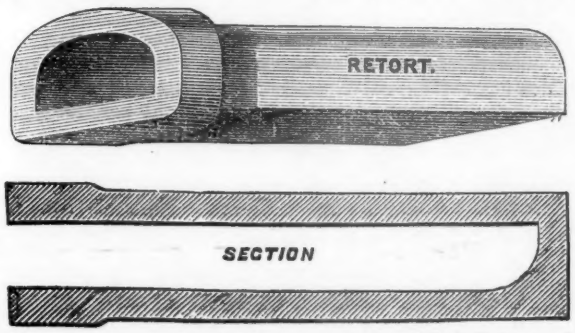

KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for Burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning, thus rendering them

Free from Cracks and Correct in Form.

By great care in Manufacturing, combined with the advantages in Burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize.

RETORT OVENS, FIRE-BRICKS, GUARDS, SADDLES, RABITTED BURS, FLUES, AND QUARRIES, ARE ALL MANUFACTURED OF THE SAME QUALITY OF CLAY.

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Apply to E. W. BARSTOW, 83 Maiden Lane, New York, where samples can be seen.

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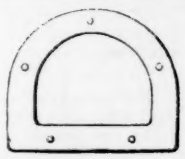
COWEN'S PATENT FIRE-CLAY RETORTS.



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Have always been, and are still, the most extensive manufacturers of FIRE-CLAY RETORTS in the United Kingdom, and were the only parties to whom a Prize Medal was awarded at the Great Exhibition, in London, 1851, for

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Orders for FIRE-CLAY RETORTS, TILES, BEARERS, and other articles in Fire-Clay, receive immediate attention, and are promptly executed at their Works, as above. Drawings of Settings adapted for Cowen's Patent Fire-Clay Retorts supplied.

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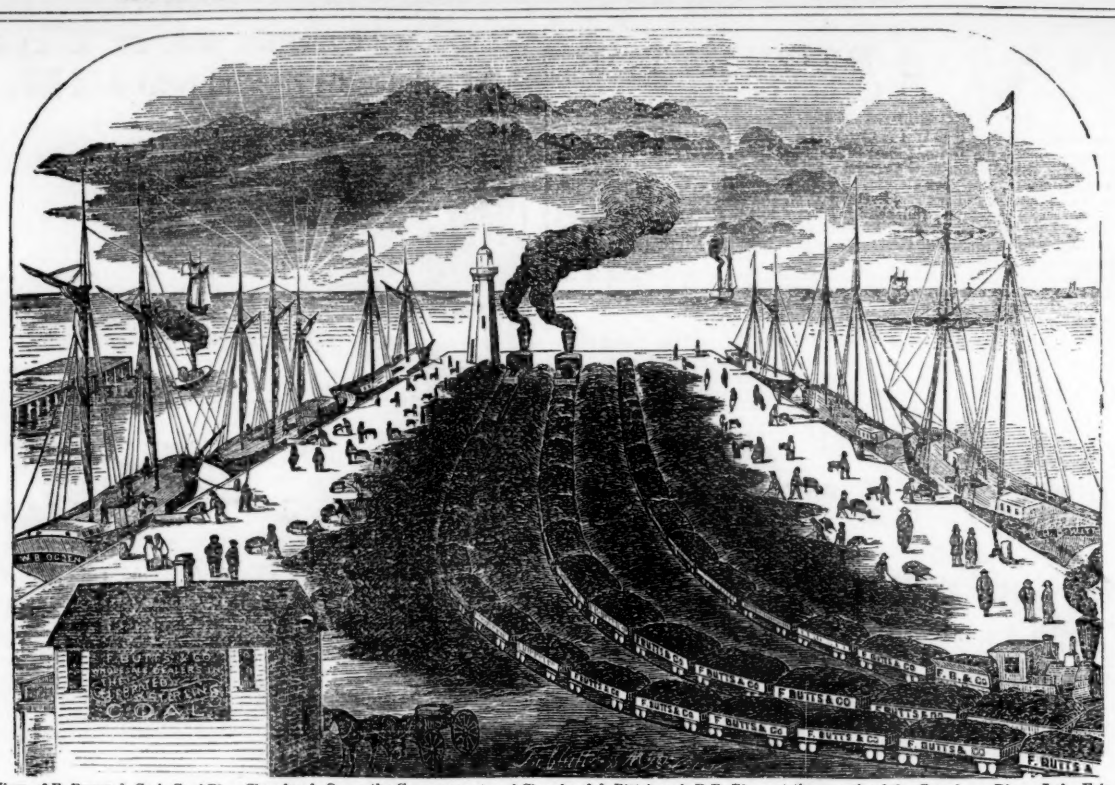
N. B.—J. C. & CO.'S RETORTS are well adapted for small Gas-Works, as they can be used without an Exhauster.



(View of F. Butts & Co.'s Coal Pier, Cleveland, O., on the Government and Cleveland & Pittsburgh R.R. Piers at the mouth of the Cuyahoga River, Lake Erie.)

F. BUTTS & CO.,

(Successors to BUTTS & KENDALL,)

DEALERS IN THE CELEBRATED

STERLING COAL!

PITTSBURGH, AND OTHER GAS COALS,

CLEVELAND, OHIO.

Dear Sir:—We beg leave to call your attention to the following, from which, and others, (and the universal expression of Gas men, as to the superior quality of Sterling Coal,) we believe that it is the best Gas Coal in the country.

From the MANHATTAN GAS LIGHT CO., New York.

Gentlemen:—Yours of the 9th inst. is received. The "Sterling Coal" received from you during the past year worked very satisfactorily—averaging 9,520 cubic feet of 15 candle Gas per ton of 2,240 lbs., and 41 bushels of Coke weighing 1,465 lbs.

We consider it among the best of American Gas Coals, for the quantity and quality of the Gas produced, and also for the excellent quality of its Coke.

I am Gentlemen, Your Obedient Servant, CHARLES ROOME, President.

From the OGDENSBURGH GAS CO., Ogdensburgh, N. Y.

January 6, 1862.

Messrs. F. Butts & Co.—This Company has used your Sterling Coal since July, 1860. We consider it the best Coal we have ever used; gives us larger yields of Gas, requires less lime, and makes a superior Coke. Respectfully, Yours, R. E. GORDON, Sup't Og. Gas Works.

From the RONDOUT AND KINGSTON GAS LIGHT CO., Rondout, N. Y.

January 10, 1860.

Messrs. F. Butts & Co.—Gentlemen:—This Company have used your Coal nearly two years. It is in every respect satisfactory, and to it is given the preference over all other coals. Its average yield is 4 40.100. The light clear and strong. The Gas is easily purified and quite free from sulphur. The yield of Coke is large and of superior quality. It is, in my opinion, equal to any Gas Coal in the market. Very Respectfully, WM. W. HAGUE, Sup't.

From the SANDUSKY GAS CO., Sandusky, O.

January 6, 1862.

Messrs. F. Butts & Co., Cleveland.—Gentlemen:—We have used your Sterling Coal for two years and six months past, and find it superior in quality and all that a number one Gas Coal can be. The illuminating power of the Gas is high, the Coke is of a superior quality, and in many instances our monthly average product has been 4 40.100 per one lb. Coal. It gives us entire satisfaction. I am, Gentlemen, Yours, Respectfully, WILLIAM HUDSON, Sup't and Sec'y.

From the TOLEDO GAS LIGHT CO., Toledo, O.

Gents:—Your favor of the 28th inst. to hand and noted.

The Sterling Coal received from Messrs. Butts & Co., the last summer and fall, fully sustains the character it has as a Gas Coal, from previous use in our works. We think the quality of Gas is very good, a little better than that produced from the Coal had of them the year previous—yielding 8,666 feet per ton of 2,000 lbs., and 36 bushels of Coke of very good quality, well adapted to our use.

Respectfully, Yours, GEO. SPENCER, President.

From the BUFFALO GAS LIGHT CO., Buffalo, N. Y.

Messrs. F. Butts & Co.—The Sterling Coal we have had from you we find to be an excellent Gas Coal. The yield of both Gas and Coke is good. The illuminating power of the Gas is high and the quality of the Coke is very good. ROBERT ROBSON, Foreman Gas Works.

From the CLEVELAND GAS LIGHT & COKE CO., Cleveland, O.

Gentlemen:—This Company has used between 3,000 and 4,000 tons of your "Sterling Coal," and are still using it with very satisfactory results. We find the average product of a ton of 2,000 lbs. is about 8,500 feet of Gas, and about 37 bushels of Coke. The Gas is of good illuminating power and quite free from sulphur or other impurities, one bushel of lime purifying 9,000 feet, and the Coke of vesy superior quality.

The yield of Gas is about the same as from the Pittsburgh Coal, and the Coke is better adapted to our use. Yours, Truly.

T. DWIGHT EELLS, Secretary.

From the ALBANY GAS LIGHT CO. Albany, N. Y.

Messrs. F. Butts & Co.—Gentlemen:—We have been using your "Sterling Coal" at these works for two years, finding it all that is important in Gas-making Coal, as respect yield and quality of Gas, and freedom from sulphur—as much so as any of the Coaking Coal in use. We are disposed to contract for a further supply of the same quality.

Very Respectfully, PAUL A. SABBATON, Sup't.

From the TROY GAS LIGHT CO., Troy, N. Y.

Messrs. F. Butts & Co.—Gentlemen:—The Coal we have used for the past year at our works has been mostly "Sterling." It has given us full satisfaction in every respect.

S. S. DAUCHY, Sup't.

The following analysis of "Sterling Coal" was made by Prof. J. Lang Cassels, Professor in the Cleveland Medical College, who stands at the head of his profession as a chemist, and any statement made by him can be relied upon with safety.

Sp. gr.	1,288
Eygremaeric Moisture	1.85
Volative Combustible Matters	34.15
Coke (clear and porous)	64.00
	100
Fixed Carbon in the Coke	62.00
Ashes (yellowish white)	2.00
	64.00

COMPOSITION OF ASHES.

Silex	0.80
Alumini	0.45
Sulphate of Iron	0.75
	2.00
Per centage of Sulphur	0.23

J. LANG CASSELS, M. D.,
Prof. of Chemistry, Clev. Med. Col.

P. S.—The specimen from which the above analysis was made was taken by myself from a car load, and may be regarded as a fair average; in fact, this coal is very uniform in its characteristics. It also yielded 4 per cent. more gas than the Pittsburgh Coal. J. L. C.

We would also refer to Gas Companies in the following places:

New York City (Manhattan and New York Co.'s), Brooklyn, Albany, Troy, West Troy, Rochester, Oswego, Ogdensburgh, Lansingburgh, Newburgh, Rome, Palmyra, Geneva, Yonkers, Rondout, Kingston, Albion, Brockport, Seneca Falls, Elmira and Lyons, in State of New York; Cleveland, Toledo, Sandusky, Norwalk, Oberlin, Salem and Fremont, in Ohio; Detroit, Ann Arbor, Grand Rapids, Kalamazoo, Jackson and Adrian, in Michigan; Coburg, in Canada; Chicago, Ill., and two Companies in Milwaukee, Wisconsin.

STERLING COAL MINES, situated in Pennsylvania, are wholly under our control; the coal mined and sold only by us or our agents. (Agents in every instance having authority over our signature.)

Five years experience in Mining, Sale and use of Sterling Coal, gives us full confidence in asserting there is no Coal that combines all the requisites so largely for a Gas or Smithing Coal as this.

This year we are several hundred yards further in the Mine than last season, and feel assured Sterling Coal will more than sustain the high reputation it has heretofore gained.

Our facilities largely increased for Mining and Shipping, we are prepared to supply the great demand for this Coal on a much more extensive scale.

Not being dependent upon high water for transportation, but receiving our Coal by RAIL, we are at all times prepared to fill orders, and ready to contract for delivery of the Celebrated Sterling Coal, on board Vessel or Cars at Cleveland, or at works of Gas Light Co's, in any of the Northern States or Canada.

Cleveland, *January* 15, 1862. Address— **F. BUTTS & CO., Drawer 74, Cleveland, O.**

By Her Majesty's Royal Letters Patent.

PATENT BITUMINIZED PIPES,

For the Conveyance of Water, Gas, and Drainage.

OFFICES: 14A CANNON STREET, LONDON, C.E.

FREDERICK W. BOND, SOLE AGENT, No. 58 LIBERTY STREET, NEAR BROADWAY, NEW YORK.

This important invention, patented by Mr. Charles Newbold, and now for the first time introduced to the notice of the British and American public, may confidently be stated to be one of the greatest interest and commercial value, as the Patent Bituminized Pipes possess all the qualities necessary for the conveyance of Water, Gas, Sewage, Mine-Pumps, &c., viz.: great strength, great durability, and inoxidability, with the immense advantage of being about *one fifth* the weight of iron pipes, and about 35 per cent. cheaper; whilst, compared with lead pipes, the Bituminized Pipes are only about *one fourth* their price, without the possibility of the formation of the oxide and carbonate of lead, so dangerous for every purpose. They will stand 150 degrees of Heat, and after many trials it has been satisfactorily proved that rats or vermin will not touch them. They also withstand the action of all acids and salts.

Iron pipes are at present frequently covered with a coating of bitumen or coal tar before they are laid down; but the adherence of this coating to the metal being very imperfect, on account of vibration and the difference of expansion, this preservation is insufficient, besides being exposed to a number of influences which neutralize its efficacy—galvanic currents materially assist the formation of oxides and deposits, which cause the obstruction and eventually the destruction of metallic pipes.

The Patent Bituminized Pipes are neutral, non-conductors of electricity, and consequently are not exposed to any of the deteriorating influences mentioned above. The process of manufacture of these Pipes consist in causing a roll of paper to pass through a reservoir of melted bitumen, after which it is tightly coiled around a mandril to any required thickness; and thus, when hardened, a tube is formed of perfect texture, great hardness, and enormous strength. These Pipes are proved, by hydraulic pressure, to resist a pressure of 220 lbs. to the square inch, equal to 506 feet head of water, which is more than double the altitude of the highest reservoir in London. The bituminous composition which unites and covers these Pipes is so well known as an excellent preservative, that it will be unnecessary to demonstrate that, when laid underground, the durability of the Patent Bituminized Pipes may be considered as unlimited. The Pipes are made in lengths of seven feet, and are connected by socket joints of the same material as the Pipes; or they can be fitted with iron flanged sockets, screwed together in a most simple and inexpensive manner.

For Gas these Pipes are invaluable; the Gas-lining which we insert effectualy resists the action of Gas, and being non-conductors, there can be no condensation in them, and the joints made with the Patent Cement are so strong as to entirely prevent Leakage.

The cost of laying the Pipe is also small, compared with those of iron, and can be done by mere laborers. Although only now introduced into England, the Bituminized Pipes have been in use on the Continent during the last three years, and those which have been employed in Paris for the conveyance of gas have been ascertained to be as perfect now as when first laid down.

DIRECTIONS FOR JOINING THE PATENT BITUMINIZED PIPES.

Pack the pipes level in the ordinary way; slip the collar over one of the pipes; draw the ends close together and warm them by putting a hot iron between them; then press them together so as to make them adhere; take a piece of iron wire netting, about half an inch in the mesh, a little narrower than the length of the collar, and long enough to wrap once round the pipe, spread the collar over it and the joining; close the ends with clay; pour the melted cement into the manhole of the collar, and fill up the interior space; then remove the clay and the joint is finished.

It is necessary to leave a small vent hole in the clay at each end of the collar to allow the air to escape as the cement is poured in, that there may be no flaws or air bubles in it when cold. If in cooling the cement settles in the manhole, fill up again.

N. B.—The cement should be broken into small pieces and melted in a pot as you do lead, at a low temperature, until it is dissolved; it must be stirred while melting; then take it off and keep stiring it as it cools until it becomes nearly as liquid as water; then pour quickly.

All Orders should be addressed to the

Patent Bituminized Water, Gas, and Drainage Pipe Company, Limited,
14A Cannon Street, London, C.E.,
ALEXANDER YOUNG,
Managing Director;
or to FREDERICK W. BOND,
Sole Agent, 58 Liberty Street,
(Between Broadway and Nassau Streets,)
NEW YORK.

SCALE OF PRICES, delivered on board ship, at LONDON.

Inside Diameter.....	2-in.	3-in.	4-in.	5-in.	6-in.	7-in.	8-in.	9-in.	10-in.	12-in.	16-in.	20-in.	24-in.	30-in.	36-in.
Price per Foot, including Collars..	s. d. 0 4	s. d. 0 6	s. d. 0 8	s. d. 0 11	s. d. 1 2	s. d. 1 5	s. d. 1 8	s. d. 2 0	s. d. 2 4	s. d. 2 8	s. d. 4 2	s. d. 6 0	s. d. 8 6	s. d. 11 0	s. d. 13 0

Cement for Joining, For Sale as above.

MEDALS AWARDED TO THOMAS GLOVER'S PATENT DRY GAS-METERS

MANUFACTORIES

SUFFOLK ST. CLERKENWELL GREEN. & ALLEN ST. GOSWELL ST. LONDON.

BOSTON, Mass., 1 Barrett Street,—August 2, 1860.

RICHARD GLOVER

BEGS TO INFORM

GAS COMPANIES AND CONTRACTORS

THAT HE HAS ALWAYS ON HAND A LARGE ASSORTMENT OF

THOMAS GLOVER'S (of London) CELEBRATED

DRY GAS METERS.

Thomas Glover's Meters have now been in use in the United States and British Provinces, for the last Fourteen Years, and are extensively used by many Gas Companies, to their entire satisfaction; and R. Glover can with all confidence refer to them in proof that Thomas Glover's Meters are— the most Perfect in Principles— the most Correct in Registration—and more Durable than any other Dry Gas Meter made in the United States or Great Britain. R. Glover will at all times be glad to repair any Gas Meters sent him at the above factory. If any of them are of Thomas Glover's manufacture, and of a more recent date than Three years, he will make no charge.

CODE, HOPPER & GRATZ,

1500, 1502 and 1504 FILBERT St., PHILADELPHIA.

MANUFACTURERS OF

Pressure Registers, Pressure Indicators,

Pressure Gauges, Photometers, Governors,

Station Meters, Customer Meters (Wet and Dry),

Experimental Meters (Wet and Dry),

Show Meters (Wet and Dry),

Meter Provers, Centre Seals, &c., &c.

The high reputation which we have enjoyed for more than twenty-two years, and the fact that we have manufactured a greater number of Gas-Meters than all other manufacturers in this country combined, must present itself as a security to parties desirous of securing the most reliable instruments. Having completed a most extensive addition to our Factory, and added many improvements to our machinery, we are enabled to fill orders entrusted to us with dispatch, and in all cases *guarantee entire satisfaction.* Our Patent Rotary-Valve Dry Gas-Meter is now used by upwards of Two Hundred Gas Companies, giving general satisfaction; we therefore recommend it, believing it superior to any other Dry Gas-Meter manufactured. All Meters tested separately by a sworn Meter Inspector, and sealed when desired.